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# A Metacognitive Approach to Teaching Reading Comprehension in the Primary School Classroom.

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# Dedication

***To my parents, Larry and Morag, an inspiration and example. Thank-you.***

# Declaration

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# Abstract

The following thesis considers the relevance of metacognitive theory to the development of children's reading comprehension. It does so by evaluating the effects of a metacomprehension training programme on children's reading comprehension. In so doing the thesis draws together the three strands of theory, teaching practice, and educational policy (i.e., 5-14 English Language Guidelines, SOED, 1991) within the context of a Scottish primary school classroom.

A pilot study was designed to investigate whether or not children were currently being taught metacomprehension strategies. The pilot study therefore, looked at children's metacomprehension development using two different teaching media: one where a novel was used as the vehicle for improving children's reading comprehension and another where a mainstream reading scheme was used for the same purpose. No differences were found between the two teaching conditions and it was inferred that children were not currently being taught metacomprehension strategies.

As a consequence of the results from the pilot study, the main research programme was designed to address two main research questions:

1. Can children be taught metacomprehension strategies by teachers?
2. Are there greater benefits for poor, as compared with good, readers?

To investigate these questions a four stage research programme was undertaken comprising:

I. the development of a metacomprehension teaching programme (Mr. Homunculus the Reading Detective).
II. the instruction of teachers in metacomprehension theory, and in Mr. Homunculus the Reading Detective
III. the application of the intervention programme by teachers to a group of Primary 5 children (mean age 9yrs 6mths), using a randomised controlled pre/post test design.
IV. the evolution and refinement of appropriate metacomprehension measures

Results were encouraging, suggesting that children could be taught to self-monitor and to regulate their reading behaviour. What was not clear was whether or not the children had improved their inferential comprehension as a result.

A model of metacomprehension development based on the data obtained from the study was presented. Further elucidation of metacomprehension development, the specific effects of such development on reading comprehension for readers of different ages and reading ability, and better measures which tap the process, rather than the product of metacomprehension, were considered as worthy of further research.

# Preface

*"A number of psychologists have the abiding intuition that metacognition is an extremely important topic, eminently worthy of further theoretical and experimental investigation. However, none of us has yet come up with deeply insightful, detailed proposals about what metacognition is, how it operates, and how it develops"* (Flavell 1987).

## i Aims and objectives of the present study

The following thesis is concerned with the application of metacognitive theory to the teaching of reading comprehension in the Scottish primary school classroom. In this context, 'metacognition' is referred to as metacomprehension, and is regarded as a contextually-specific subset of the more general concept of 'metacognition'. Children's metacomprehension knowledge and awareness are regarded as key components of successful reading comprehension. Furthermore, children's abilities to self-monitor, regulate and organise their knowledge about reading strategies are seen to be critical features of successful comprehension and are central defining characteristics of metacomprehension in the present study.

The research is guided by Flavell's thesis, namely, that metacomprehension is important in the teaching of reading and that it should enhance the teaching and learning process. Set within the context of the legislative framework outlined in the 5-14 English Language Guidelines (SOED 1991), together with the practice of using a novel as a vehicle for introducing comprehension strategies to children in the classroom, the thesis makes an attempt to link theory, practice and national policy.

Specifically, the thesis is concerned:

1. to explore the extent to which metacomprehension strategies are already being taught in the classroom, as this will be relevant to the development of any future metacomprehension intervention programme (*pilot study*).

2. to compare the use of the novel and mainstream reading scheme on the acquisition of metacomprehension strategies (*pilot study*).

3. to develop methods of assessing children's metacomprehension strategies (*pilot and main studies*).
4. to train teachers to teach metacomprehension strategies to children, using the novel as the vehicle for dissemination (*main study*).
5. to compare the effects of metacomprehension instruction on good and poor readers (*pilot and main study*).

## ii Structure of thesis

To investigate the issues described, a three stage research programme was implemented comprising:

1. a pilot investigation designed to determine existing practice, and to explore methods for measuring metacomprehension.
2. the development of a metacomprehension reading programme entitled Mr. Homunculus the Reading Detective, designed to be used by teachers with Primary 5 children (mean age 9yrs.6mths).
3. the evaluation of the metacomprehension programme in relation to children's metacomprehension development.

In discussing the foregoing, references have been made to metacognition, and metacomprehension strategies, but what is meant by these terms and how might they be measured? Additionally, is there any empirical evidence to justify the belief outlined at the beginning, namely, that metacomprehension is important in the cognitive area of reading comprehension? If the theory related to metacomprehension is important, in what ways is it important and how might children be taught metacomprehension strategies?

To begin to address some of these questions Chapter 1 is devoted to the definition and measurement of metacognition in relation to reading comprehension, i.e., metacomprehension. The reader will then be introduced in Chapter 2 to a review of the literature relevant to the study of metacomprehension, and providing evidence for the claims made at the beginning of the preface that metacomprehension is important to the

teaching of reading comprehension. The context for learning within the Scottish classroom is described in Chapter 3, followed by an account of the pilot study in Chapter 4. Chapter 5 provides a description of the metacomprehension reading programme devised for the main study, and Chapter 6 describes the implementation of the programme with a group of primary 5 (mean age 9yrs 6mths) children from three different schools. Chapters 7 and 8 discuss the results of the main study and attempt to provide a model of metacomprehension development. As with most research, in providing a model more questions are raised, necessitating further empirical investigation. Chapter 8 therefore, attempts to refine the present study and highlight the key issues emanating from the research.

# Chapter 1: Metacognition and Reading Comprehension - what is it and how is it assessed?

## 1.1 Metacognition: A conundrum

Metacognition is thinking about one's thinking; it is that cognitive activity which allows one to keep track of one's own cognitions whilst performing various cognitive tasks. Metacognition is central to thinking and learning, allowing one to 'learn how to learn' (Brown 1978; Puntambekar, 1995). The concept of metacognition is therefore important in a world which emphasises the need for individuals to transfer skills across a wide range of activities, since it is our ability to reflect on our own thinking, and modify behaviour on the basis of such reflection (i.e., to behave metacognitively), which enables us to transfer skills and knowledge across cognitive domains. Given its apparent pervasiveness as a concept and its central role in cognition, it is perhaps not surprising that metacognition has become of such interest to applied cognitive psychologists. However, whilst 'metacognition' seems to hold some attraction for the applied psychologist, it is a concept which has justifiably been criticised for being "fuzzy" (Marshall and Morton, 1978; Flavell, 1981), ill defined (Wellman, 1983), and frequently over generalised so as to include almost any form of strategic behaviour (Brown, 1987). Such criticisms remain valid and are perhaps endemic to an area of study which attempts to look at processes which are not observable and may occur according to Flavell (1987) at an unconscious level. Additionally, definitions of metacognition tend to imply that there are common 'meta' processes which apply across a wide range of cognitive functions, yet most studies have tended to investigate the concept within specific cognitive domains (e.g., memory (Flavell 1976), language (Lundberg and Torneus 1978) and reading (Brown 1980). Such a tendency suggests that there may be some merit in defining metacognition in relation to the specific cognitive area under investigation. Thorpe and Satterly (1990) noted such a point finding that: "*whilst there was a common pattern of (*metacognitive*) development in children's responses (*to four different thinking tasks*), there did not appear to be a common*

*(unified) metacognitive factor"*[1].

Apart from Thorpe and Satterley's (1990) study there does not appear to have been any other empirical research designed specifically to test whether or not the same 'meta' elements apply across cognitive domains such as memory, language, and reading. Instead, researchers have tended to circumvent the problem by describing metacognition in relation to the particular cognitive domain being investigated. For example, if it is a study about reading then metacognition is defined in terms of knowledge and experiences related to reading. In this way some of the ambiguities related to the more general concept of 'metacognition' are reduced. Chapter 1 will attempt to look at the general concept of 'metacognition', leading the reader towards a definition of the concept as it relates to the specific cognitive area of reading comprehension.

It can be seen from this brief overview that the term 'metacognition' presents a number of problems. If definitions of metacognition continue to be ill-defined then it is difficult to know what it is, and consequently, how its occurrence can be identified and measured. Both issues, concerned with definition and measurement, have the potential to create difficulties for the applied psychologist when trying to translate theory into practice. Given the impact of definition on shaping empirical research, the following will be discussed:

- metacognition as defined and conceptualised <u>across</u> cognitive domains
- the concept of metacognition as it applies to the <u>specific</u> cognitive area of reading comprehension (i.e., metacomprehension)
- the impact of affective variables on definitions of metacognition
- the measurement of metacomprehension.

## 1.2 Definitions of the concept of 'metacognition'

The concept of metacognition has been around at least since the mid 1970's and is generally attributed to John Flavell, who used the term in relation to memory, and coined the phrase 'metamemory' (Flavell, 1971). <u>He defined metacognition</u> in 1971 as:

[1] plain text author's insertions

*"knowledge*[2] *that takes as its object or regulates any aspect of any cognitive endeavour"* , and later in 1976 as:
*"one's knowledge concerning one's own cognitive processes and products or anything related to them, e.g., the learning-relevant properties of information or data.....Metacognition refers among other things, to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in the service of some concrete goal or object"* (Flavell 1976).

Using similar terminology, Moore (1982) defined metacognition as:

*"an individual's knowledge about various aspects of thinking"*

Gordon and Braun (1985) specified that:

*"Metacognition refers to an awareness of our own cognitive processes (thinking and learning activities) or knowing about what we know. Further, metacognition refers to strategic regulation of our own cognitive processes".*

Later in 1994, Wray noted that:
*"the term 'metacognition' is used to refer to the deliberate conscious control of one's own cognitive actions (Brown 1980) - that is, cognition about cognition: thinking about thinking".*

The above definitions have been presented chronologically to demonstrate how definitions of metacognition have changed. Early definitions tend to emphasise the knowledge aspects of metacognition. This is demonstrated by statements which relate to concepts such as 'self-awareness of knowledge', and' knowledge about one's cognitions'. Later definitions include knowledge of one's cognitions and cognitive processes but also emphasise the importance of self-regulation and cognitive control of one's cognitions. Words conveying ideas of intentionality, deliberate selection and orchestration of knowledge (vis. Flavell 1976 and Wray 1994), and self-monitoring and 'strategic regulation' begin to play a more significant part in

[2] author's underlining

describing the concept of metacognition. Gordon and Braun (1985) emphasise this point in relation to Flavell's (1976) later conceptualisation of metacognition, noting that:

*"the definition* (i.e., that by Flavell ,1976) *therefore extends beyond awareness of one's cognitive processes (self-awareness) to the* ***deliberate*** [3] *and* ***conscious*** *control of these actions (self-control)"*
(Gordon and Braun 1985)

It will be argued here that the conscious control and discriminative use of cognitive skills are important features of metacognition. Such behaviour allows learners to monitor the success or failure of their cognitive activities, and to apply remedial strategies if necessary, thereby demonstrating independent learning. Being an independent learner is regarded by the present author as an important pedagogical goal and is particularly emphasised by Brown (e.g., 1978, 1980, 1987) and Puntambekar (1995), in relation to children's reading, encapsulated in their use of the phrase "learning how to learn".

To summarise the preceding, metacognition applies to both awareness of knowledge (i.e., knowing about knowing) and awareness of cognitive process (i.e., thinking about one's thinking). It also involves the monitoring and regulation of information provided by such awareness. Thus, metacognition may be conceptualised as having four aspects:

a) awareness of one's knowledge about a specific cognitive domain
b) awareness of one's cognitive processing in that cognitive domain
c) the deliberate selection and organisation of knowledge
d) the deliberate monitoring and regulation of cognitive processing

It may be argued that early conceptualisations of metacognition tended to concentrate on a) and b), whilst more recent formulations of the concept have emphasised c) and d). It is the regulation and orchestration of cognition which is of particular interest to the present thesis since it will be argued that such behaviour allows children to become independent learners, managing their own learning in the pursuit of better

[3] authors emphasis in bold

understanding.

Before looking at how the concept of metacognition applies to reading comprehension it is perhaps useful to look more closely at Flavell's (1979; 1981) elaboration of the concept since his views have been instrumental in the design and structure of subsequent research and continue to be influential in the thinking and development of the study of metacognition.

## 1.3 Metacognitive knowledge and experiences.

Flavell (1979, 1981) suggested that metacognition may be described as having two main components, metacognitive knowledge and metacognitive experiences.

Metacognitive knowledge is *".... simply that portion of the total knowledge base that pertains to a given area of cognitive activity"*. He also notes that *"as with other knowledge acquisition, metacognitive knowledge grows in a slow and gradual fashion through years of experiences in the domain of cognitive activity"* (Flavell 1985, quoted by Garner, 1987) The implication is that there is specific metacognitive knowledge in relation to each cognitive domain. Thus, in the cognitive domains of reading, memory and verbal communication respectively, one can have metacognitive awareness of the process of decoding print, the process of storing or retrieving information, and the grammatical structure of spoken language. Such metacognitive knowledge can be subdivided into three components of **person, task** and **strategies** (Flavell 1979). In real life each of these aspects of metacognitive knowledge will interact with one another, acting in supportive roles (see Flavell, 1985). For example; in the cognitive area of reading, one might have person knowledge about oneself as a reader. Experienced readers may know that when they are tired they are more likely to make mistakes. In addition, they might also know that academic research papers need careful and analytical reading (task knowledge). To succeed in reading such a text when one is tired might involve the skills of re-reading and underlining (strategy knowledge) so as to ensure that important information is not missed due to tiredness and the nature of the task. In this example all three types of metacognitive knowledge described by Flavell (1981) are used to achieve the cognitive goal of reading with

understanding.

Metacognitive experiences reflect more of the self-regulation and monitoring aspects of metacognition defined previously as points c) and d) on page 5, and can occur before, during, and after an ongoing cognitive enterprise such as reading or remembering (Flavell, 1979, 1981). Flavell notes that the first indication that an individual may have of a metacognitive experience is a 'feeling of uneasiness', that is, something is not quite correct with one's cognitive processing. He describes the 'tip of the tongue' phenomenon as an example of a metacognitive experience. Individuals may be aware that they have relevant information 'in their head' (presumably because they have been monitoring and regulating their cognitive processing) but are unable to retrieve it. Having a metacognitive experience should prompt the application of metacognitive strategies, so as to resolve the conflict. For example, whilst reading a text readers may become aware that they have not understood the last few lines of print (i.e., they will have a metacognitive experience). Such a metacognitive experience may result in readers stopping and deciding to re-read the last few sentences (an example of deliberate selection and organisation of knowledge: see c) page 5) in order to better understand the text. In this example, re-reading is instigated as a result of monitoring understanding and as such is part of the regulating and monitoring functions of metacognition.

Making people aware of their metacognitive experiences is an important pedagogical task since such awareness allows the individual to continue to make cognitive progress. For example, if readers were not aware of their failure to understand (a metacognitive experience), then they would continue to read the text and fail to extract any meaning. Such a phenomenon may explain why young and poor readers fail to spot deliberate miscues in text since they are unaware of having a metacognitive experience and therefore fail to take appropriate action such as stopping and reporting the errors (Markman 1979; Yuill and Oakhill 1988)
The processes described above form a complex system devised to enable the individual to achieve their cognitive goals. As Garner (1987) succinctly states, "*metacognitive knowledge is a basis for metacognitive experiences*

*that in turn prompt the use of cognitive and metacognitive strategies.*". Alternatively, metacognitive experiences can prompt the use of metacognitive knowledge, which in turn may invoke the use of cognitive strategies. For example, if children are aware of miscues in print because they detect a failure in their continued understanding of what they are reading (metacognitive experience), then they are likely to respond by instigating remedial strategies such as re-reading (metacognitive strategy knowledge ), to achieve the cognitive goal of understanding the sentence.

A potential area for confusion that is apparent throughout the metacognitive literature, is the distinction between metacognitive and cognitive behaviour (e.g., Garner 1987, Pressley and Woloshyn 1995). For example, what makes a strategy cognitive as compared with metacognitive, and is it possible or relevant to try and make such a distinction? In the previous example it was indicated that 're-reading' was a metacognitive strategy. However, in other circumstances 're-reading' might be described as a cognitive strategy. It will be shown in Section 1.4, that the purpose of the behaviour serves as a distinguishing feature. Thus, when re-reading is used to *monitor* ones cognitive processes it is metacognitive, but when it is used to achieve the cognitive goal of, for instance, finding a key word to answer a question, then it is a cognitive strategy.

It would seem important for practitioners to know the differences between metacognitive and cognitive strategies if they are to present the right emphasis and balance to their instruction of, for instance, reading comprehension skills. Secondly, in order to measure changes in cognitive and metacognitive strategy use, one needs to be able to differentiate between the two. Practically, this may be an impossible task since it could be argued that for individuals to achieve cognitive goals such as reading with understanding, the cognitive/metacognitive 'system' needs to operate in its entirety to be successful. In trying to empirically distinguish boundaries between cognitive and metacognitive processes the 'system' is interrupted, thereby distorting its functioning and producing unreliable results. Such criticisms have been made in relation to the use of think-aloud procedures designed to measure metacognitive processes as readers are actively involved in a cognitive task (see Garner 1990). The

very fact that readers are required to talk about their thinking as it occurs interrupts the process and produces confounding results. The example provided highlights one of the methodological problems inherent in the measurement of metacognition and the need to be clearer, if possible, about the boundaries between cognition and metacognition. It is not an easy distinction to make because of the interactive nature of the system being described. However, it is a necessary distinction to make because of its impact on the measures chosen to assess metacognition and the content of instructional programmes. The following section will attempt to provide a clearer picture of what might constitute metacognitive, as compared with cognitive behaviour. The issue of measurement will be addressed later in Section 1.8.

## 1.4 Cognition or metacognition: what are the distinguishing features?

In attempting to describe the transition from cognitive to metacognitive, Flavell (1976) provides the following example:

*"Asking yourself questions about the chapter might function either to improve your knowledge (a cognitive function) or to monitor it (a metacognitive function)".* For example; whilst reading, children may continually stop and ask themselves a question about what they have just read. The reason for so doing would be to assess their present level of understanding, thereby allowing them to self-evaluate their 'reading with understanding' performance. In this example, asking questions for the purpose of self-evaluation performs a metacognitive function since the behaviour is executed as a means of monitoring the cognitive process of decoding print. On the other hand, if the function of asking questions about the chapter was simply to find a specific piece of information in the text, thereby increasing one's knowledge then the activity may be described as cognitive. In this example, the purpose of the behaviour is an important differentiating factor. The observable behaviour of asking questions is the same but the reason and function of the activity is different.

Cognitive strategies might be regarded as the 'nuts and bolts' of the thinking process: for instance, the ability to decode print, or to ask questions to improve one's knowledge rather than to monitor it, or to re-read in order

to find a key word. Metacognitive strategies are reflective, providing some form of executive control over cognition. For example, readers could decode print and gain no meaning from the cognitive activity. They are simply working out what the words say without attaching any meaning. In such circumstances reading for understanding cannot be achieved unless readers activate some metacognitive strategies such as monitoring the cognitive process of decoding print to ensure that meaning is being extracted from the activity of decoding, and taking <u>appropriate</u> remedial action when understanding begins to fail, such as re-reading. In this example, readers are both monitoring behaviour and applying appropriate remedial procedures to ensure that reading with understanding is achieved. Both are consequences of metacomprehension, since they are dependent on readers having an awareness of their cognitive processes as they occur.

This subtle, yet important difference is elaborated by Flavell (1987) when he states:*"In the course of development one learns about cognitive strategies for making cognitive progress and about metacognitive strategies for* ***monitoring*** *the cognitive progress"*. The metacognitive aspect of cognition might therefore be likened to a kind of mind video camera, monitoring cognitive processes, rewinding, pausing and replaying, as necessary, so as to allow the process to proceed smoothly.

The essence of metacognition would seem to be encapsulated in the above metaphor, suggesting that it is a reflective process, involving the continuous monitoring of one's thinking, and could be seen as a kind of homunculus, orchestrating one's cognitions into a meaningful whole. Such behaviour should demonstrate itself in better self-control of one's learning (cf. Garner 1987; Brown 1987), making one more sensitive to break downs in one's cognitive processing, and as a result producing more effective learning outcomes.

## 1:5 Metacognition as applied to reading

As noted previously, it is helpful when discussing the concept of 'metacognition' to set it within the specific cognitive domain under investigation. In this way it is possible to describe more precisely the type of metacognitive knowledge and experiences to which one is referring. As the

present thesis is concerned with the application of metacognition to reading comprehension, it would seem sensible to describe the concept as it applies to this cognitive domain.

The teaching of reading in schools has traditionally been viewed as a mechanistic decoding process based on the alphabetic principle (i.e., letters stand for sounds and sounds can be combined into words). The reader was therefore thought to *"proceed letter by letter to unlock sounds (and then) to combine these into words to string together into sentences"* (Orasanu and Penney 1986). Such an approach varies little from the basic assumption about reading held by the ancient Greeks. While decoding is an essential part of reading, it is not sufficient in itself. Reading is a complex interaction of skills dependent, for example, on prior background knowledge (Anderson et al. 1977), experience with different texts and story genre (Stein and Glenn 1978) and general linguistic skills and knowledge (Mattingly 1972; Moore 1982). Importantly, readers are seen as actively constructing meaning from a text, making educated guesses about which word comes next in the sentence, reformulating hypotheses about the author's intent, and generally making inferences. Reading for meaning is therefore an integral part of the whole process. As Orasanu and Penney (1986) have stated:

*"a critical difference between the old and new views (of reading) is the status of meaning: in the old view the meaning resides in the text, the readers task being to ferret it out: in the new view, the reader creates meaning based on the text, and her or his existing knowledge about its content , language and structure".*

Recent research in the area of reading views readers as active participants in the process, having knowledge about the nature of the task and the influences of previous background information, and being able to reflect on their ongoing performance, taking remedial action when necessary. At both the elementary stage of learning to decode print and at the higher order level of gaining information and knowledge from print, readers are involved in thinking about their ongoing cognitive behaviour, and responding to the information provided. The response of readers might be to continue reading if comprehension is assessed as occurring, or alternatively to

choose an appropriate remedial strategy which will improve understanding. To make an appropriate choice of strategy, readers must be aware of what information and procedures they can use to rectify a failure to understand: In other words, they must use their metacognitive awareness of knowledge and process. If one recaps on the previous definitions of 'metacognition' it is possible to see that the concept is reflected in these modern views of reading.

The discussion below will look in more detail at how metacognition has been described in relation to reading comprehension. In so doing, it will be possible to see the parallels between Flavell's descriptions of metacognition as previously discussed, and those of researchers interested in its application to reading.

Gavelek and Raphael (1985) define metacognition as applied to reading comprehension as:
*"the abilities of individuals to adjust their cognitive activity in order to promote more effective comprehension".*

In Gavelek and Raphael's (1985) definition there is no reference to how individuals adjust their cognitive activity, or how they know when it is necessary to do so. From the previous discussion in section 1.3, one might presume that 'cognitive adjustments' are made as a result of metacognitive experiences which occur while readers are involved in decoding and integrating text. Such metacognitive experiences will in turn lead to alterations in readers' behaviour, and a consequent reassessment of their level of understanding.

Baker and Brown (1980) provide a clearer description about what readers do when they are behaving metacognitively. They state that:
*"reading for meaning involves that cognitive activity of comprehension, which entails keeping track of the success with which one's comprehension is proceeding, ensuring that the process continues smoothly, and taking remedial action if necessary".*

In Baker and Brown's (1980) definition cognisance is paid to the self-

regulatory aspect of reading - 'keeping track' and 'ensuring that the process runs smoothly', and to the application of appropriate metacognitive strategies -'remedial action'. They state that because readers must exercise some self-awareness and self-control of cognitive activities during reading, most characterisations of reading include skills and activities that are 'metacognitive' in nature. One might criticise such inclusive definitions of metacognition as being nebulous, lacking precision and of little use to the empiricist. In fact, Brown (1987) makes this observation in relation to her own previous descriptions of metacognition but does not provide an answer to the problem. However, it is indeed difficult to imagine how readers might extract meaning from print without monitoring their understanding whilst decoding and therefore, by definition behaving metacognitively. The argument would be, that reading comprehension cannot occur without the use of metacognitive behaviour. If this is the case then one might expect readers who are not behaving metacognitively to be poor comprehenders and to fail to detect break downs in their understanding as they read. Research to be discussed in Chapter 2 will demonstrate that this does appear to be the case, with for instance, some young and poor readers failing to detect deliberate miscues inserted into texts, presumably because they had been decoding print (a cognitive activity) without monitoring the sense (a metacognitive activity, Markman, 1979).

Baker and Brown (1980 pp.4-5)) provide a list of metacognitive reading strategies which they view as important to comprehension, and which are helpful in providing further concrete examples of the kind of metacognitive strategies thought to be relevant to reading comprehension. These strategies are listed as:

a) clarifying the purposes of reading, that is understanding both explicit and implicit task demands

b) identifying the important aspects of a message

c) focusing on the major content rather than trivia

d) monitoring ongoing activities to determine whether comprehension is occurring

e) engaging in self-questioning to determine whether goals are being achieved

f) taking corrective action when failures in comprehension are detected

The first three behaviours relate to Flavell's (1979, 1981) description of metacognitive knowledge at task and strategy levels. The last three might be categorised as metacognitive awareness of cognitive process since they are related to readers' ongoing comprehension.

To recap, Baker and Brown's (1980) and Brown's (e.g., Brown 1978; 1987) descriptions of metacognition as it relates to reading, emphasise the self-regulation and self-management of readers' cognitions about reading comprehension. It is how readers manipulate and orchestrate their metacognitive experiences to adjust their cognitive progress which is of interest. Brown's (1978; 1987) and Baker and Brown's (1980) conceptualisations of metacognition as applied to reading are particularly pertinent to the present author's view of the concept. It will be seen in Chapter 2, that young and poor readers are not good at monitoring their reading behaviour, and have limited awareness of the metacognitive strategies which they can deploy to help themselves understand (see Brown, Armbruster and Baker, 1986). Additionally, and perhaps related, teachers do not seem to facilitate children's metacognitive awareness (Paris, Wasik, and Van der Westhuizen, 1988), in fact they appear not to teach children how to comprehend (Durkin 1979). It is these aspects of metacognition:- monitoring and self-regulation of cognitive processes, awareness of one's knowledge about reading, and the integration of such metacognitive behaviours, which are of interest to the present thesis. Making readers more aware of their level of understanding as they are involved in the process of reading, and teaching them *when* and *why* to implement appropriate strategies to rectify self identified failures in comprehension, would seem to be important pedagogical tasks and ones which are not ***overtly*** taught by teachers to children (Paris, 1991; Clark 1996)

In a similar vein to Brown (1987), Paris, Lipson, and Wixson (1983) emphasise the *self-management* and *control* of one's cognitions in relation to reading, underlining the importance of these aspects in defining metacognition. They describe metacognition in terms of 'strategic' reading behaviour. Being a 'strategic reader' would seem to be synonymous with being metacognitive (Paris et al. 1983). To be a strategic reader, Paris et al.

(1983) argue that readers need to know *what* reading is, *how* to gain an understanding of print, and *when* and *why* to manipulate both the *'what'* and the *'how'*, to effect better understanding.

Their description of the strategic reader draws on work by Bruner (1972) and Resnick (1983) who describe knowledge as being declarative and procedural in nature. Declarative knowledge *"includes propositional beliefs about the task characteristics and personal beliefs"* (Paris et al. 1983). In reading, this might be knowing that the title helps set the scene ('task characteristics'), and that "I am a fast reader when I can decode all the words easily" ('personal beliefs'). Procedural knowledge *"includes the execution of various actions"* (Paris et al. 1983). An example of procedural knowledge might be knowing how to skim, or how to use the title of the story to help make predictions, or set the context for reading.

From these descriptions of declarative and procedural knowledge, it is easy to see parallels with Flavell's (1979, 1981) categorisation of metacognitive knowledge into person, task and strategy variables. Flavell's person and task variables can be seen as a form of declarative knowledge, whilst Flavell's strategy variables constitute procedural knowledge. This is in accordance with Flavell's (1985) later view that metacognitive knowledge is no different from any other knowledge system, some is declarative and some is procedural. If this is the case, then how does one differentiate between metacognitive knowledge, and other forms of knowledge? A distinction might be made by demonstrating that readers:

I. were aware of specific declarative and procedural knowledge, and
II. were able to control, manipulate and invoke such knowledge as a means of monitoring and regulating their cognitive progress in the pursuit of a specific cognitive goal.

This distinction relates directly to the previous definition of metacognition (see page 5), where it was proposed that metacognition may be conceptualised as having four aspects :

a) awareness of one's knowledge about a specific cognitive domain

b) awareness of one's cognitive processing in the specific cognitive domain

c) the deliberate selection and organisation of knowledge

d) the deliberate monitoring and regulation of cognitive processing

It can be seen that I) relates to a) above, that is an awareness of ones knowledge about a specific cognitive domain, and II) maps onto b), c), and d), awareness of cognitive processing, selection and organisation of knowledge and the deliberate monitoring and regulation of cognitive processing.

For example, readers might be aware that the title of the story is a useful aid to understanding (task/declarative knowledge), and use this (i.e., deliberate selection and organisation of knowledge) to stimulate prior background knowledge which they know they have about the subject (i.e., strategy/procedural knowledge), to help infer information (cognitive goal) while involved in the reading process.

In Flavell's description of metacognition there is no explicit attempt at explaining ***why*** an individual might choose to draw upon some kinds of 'metacognitive knowledge' and not others. For example, why choose to use the title and not the picture to help provide a context for reading, or why decide to skim a text rather than scan? It might be argued that such decisions involve an interaction of metacognitive experiences and knowledge. For example, if one decided to skim an academic text to find a specific piece of information one would quickly find out, as a result of a metacognitive experience of 'uneasiness', that skimming was ineffectual. This in turn would lead one to chose an alternative strategy such as scanning, which in turn would be monitored and evaluated to see if one's cognitive goal was being achieved, in this case, to find a specific piece of information. Paris et al. (1983) added the category of *conditional* knowledge to try and explain readers' discriminative use of declarative and procedural knowledge. They state that: *"In one sense, conditional knowledge helps the agent to orchestrate and to modulate declarative and procedural knowledge by fitting that information to particular tasks and contexts"*. The conditional element might be likened to an homunculus

which regulates the agent's behaviour, and is similar to what Flavell (1981) refers to as a 'metacognitive experience'. It determines *why* and *when* certain strategies are deployed.

The addition of conditional knowledge to the traditional taxonomy of declarative and procedural knowledge is Paris et al.'s (1983) contribution to the metacognitive debate. At issue is whether conditional knowledge *is* metacognition, or is it as postulated, akin to Flavell's description of metacognitive experiences. The author would suggest that conditional knowledge relates to the self-regulatory aspects of metacognition and is therefore similar to Flavell's description of 'metacognitive experiences'. As quoted by Paris et al., conditional knowledge allows the reader to orchestrate and modulate their cognitions, and as such relates to aspects c) and d) of the previous definition (i.e., the deliberate selection and organisation of knowledge, and the deliberate monitoring and regulation of cognitive processing). Conditional knowledge is therefore important to the present thesis since, as noted previously, it is this which allows individuals to become independent comprehenders, or as Brown (1978), and later Puntambekar (1995) state - "to learn how to learn". Declarative and procedural knowledge when used reflexively represent metacognitive knowledge at person, task and strategy levels. Such views are implied by Pressley and Woloshyn (1995) when discussing cognitive strategy instruction. They note: *"It is necessary to impart metacognitive information about strategies .....teaching metacognitive information about strategies boils down largely to making sure that students know* ***when*** *the strategies they are learning should be deployed"* (i.e., they need conditional knowledge). For Pressley and Woloshyn (1995) the metacognitive aspect of strategies is the conditional component. However, given the foregoing discussion such a view would be limiting, and should more correctly be redefined in relation to metacognitive experiences. Thus, the metacognitive information about strategies to which Pressley and Woloshyn (1995) are referring is perhaps more correctly defined as, metacognitive experiences.

Flavell's (1979; 1981), Brown's (1978; 1987), and Paris et al.'s (1983) interpretations of what constitutes metacognitive behaviour have many overlapping features. Importantly, they all emphasise the controlling

function of metacognition, the idea that cognitive behaviour requires monitoring in order to ensure that cognitive progress is made. Metacognition is therefore the inner voice, or homunculus, which orchestrates the individuals' cognitions, allowing them to behave strategically. In reading comprehension this might involve readers in keeping track of their decoding behaviour to ensure that meaning is being extracted, or at a more sophisticated level, checking their level of understanding by generating self-questions, to ensure that implicit information is being extracted from the text. Metacognitive behaviour also involves an awareness of the reading task demands, and which reading strategies might be most effectively deployed to ensure ongoing understanding. Finally, ability to act on one's metacognitive awareness of task and strategy knowledge will be dependent on one's motivation.

## 1.6 Metacognition and motivation

Individuals' motivation, self-esteem, and attributions of success or failure in learning are important aspects of cognition generally (e.g., Covington 1992), and one would assume must also have a bearing on metacognitive behaviour. The following will therefore provide a brief overview of how motivational factors may relate to metacognition.

If metacognition is about the self-regulation and self-management of one's ongoing reading behaviour, then it might be assumed that readers need to:

I. have sufficient metacognitive awareness of knowledge at person, task and strategy levels to have something to regulate and manage
II. be aware of their ongoing reading behaviour so as to monitor their cognitive progress, and
III. be sufficiently interested to activate i) and ii) in the pursuit of their cognitive goal (i.e., reading with understanding).

It might be assumed, that if readers are not motivated to apply their metacognitive knowledge, or do not believe in their own ability to do so, either because the task is judged as being too difficult or that they are not sufficiently able, then irrespective of whether or not they have cognitive and metacognitive abilities, they are unlikely to be successful. Individuals' feelings about themselves as readers are therefore important and relate

directly to Flavell's (1979; 1981) description of 'metacognitive knowledge' at a person level. Cross and Paris (1988) emphasise the importance of person variables when discussing the instruction of metacognitive reading strategies. They note that *"metacognition includes informed, affective, and motivated self-appraisals"*. They believe that if children are not motivated, perhaps because they see themselves as incapable, then they are unlikely to become involved in the self-regulatory aspects of metacognition. It might be argued that motivational factors are most likely to influence the conditional aspects of metacognition. Thus, irrespective of whether or not children have declarative and procedural knowledge, they are unlikely to apply it if they lack the motivation to do so.

Given that motivational variables would seem to have a bearing on metacognitive behaviour it is perhaps surprising that the two research areas have not been more closely linked. A few recent exceptions do exist, (e.g., Pintrich, Anderman and Klobucar, 1994; and O'Sullivan and Joy, 1994). However, few studies have looked directly at the causal relationships, if any, of motivational variables such as self-esteem, self-efficacy and the attribution of success and failure on metacognitive outcomes. For instance, if readers believe themselves to be good at reading, do they demonstrate better metacognitive behaviour than children who do not believe themselves to be good? The question posed is concerned with children's self-concept of themselves as readers and how, and to what they attribute success (i.e., ability or effort). Of the empirical research which has included motivational factors such as the attribution of effort and ability to success (e.g., Kurtz-Costes, Ehrlich, McCall, and Loridant 1995; Clark 1996), the tendency has been to 'tag on' attributional forms of intervention with the main focus of the study which has been to improve children's comprehension through metacognitive training. The effects of attribution theory to metacognitive outcomes have therefore been subsidiary to the main study, or integrated such that it is difficult to tease apart which were the significant factors; attributional training, metacognitive training, or a combination of the two. Additionally, most of the studies have been correlational, rather than multivariate, and as such claims of causality would be inappropriate.

It is perhaps not surprising that the two research areas of motivation, and metacognition tend to exist as separate areas of study. Each has its own theoretical and conceptual problems associated with definition, measurement and application. When combined, the number of empirical obstacles are magnified, making it difficult to come to any firm conclusions. The enormity of the problems associated with the combination of the two research areas are highlighted by Weinert, Rainer and Kluwe (1987), who note that:

*"An attempt to integrate motivation and metacognition means one must relate theoretical concepts concerned with knowledge about the self, performance expectations and monitoring of one's own actions as perceived in the metacognition literature with concepts such as self-perception of ability, expectations of success and fear of failure, causal attributions for success and failure, and processes of self-evaluation, from the motivation research domain. These two research traditions, metacognition and motivation, have as yet been largely independent, with little common ground."* (1987)

It may be that the two areas will remain 'largely independent' until a better understanding of the concepts described above is achieved. One would need more precise definitions of concepts such as 'self-perception of ability', 'self esteem', and 'self-concept'.

Burden (1996) highlights this very difficulty within the research literature relating pupils' perceptions of themselves as thinkers and learners and consequent educational achievement. He notes that to avoid confusion when comparing studies purporting to be measuring the same concept, a *"clear distinction needs to be made between the semantic use of such terms as self-concept, self-esteem, self-image, self-efficacy and self-regard"*

In addition to the definitional problems described, there are associated measurement problems. If one cannot define the concept to be measured, then it is difficult to conceive of the development of appropriate and reliable measurement tools. As researchers in the field have indicated, much of the research in the area of self-perception, motivation and attribution theory has

produced equivocal results possibly because studies have been measuring different processes with different tools. Burden (1997) claims that the research in the area is little different now, than when Wylie (1961) concluded that *"the whole area (i.e., that of self-concept and its relationship with achievement) was a philosophical and psychometric mess"*.

In the present thesis no attempt is made to empirically investigate the effects of motivational variables on metacognitive outcomes, since this was felt to be out with the scope of the study. However, the possible motivational influences of the novel study, making it a sympathetic vehicle for disseminating metacognitive training, are considered and discussed in Chapter 3, Section 3.4.

## 1.7 A working definition

Metacognition is the generic term used to describe the kind of strategic, self-regulatory behaviour evident in all areas of cognition such as language, memory, and reading. When metacognition is used in the cognitive domain of reading comprehension, it might more accurately be referred to as metacomprehension. In this context metacomprehension represents a specific subset of metacognition. Such a focus is helpful when trying to describe the type and form of metacognitive knowledge and experiences specific to reading comprehension, as compared for instance, with memory. For the purposes of the present thesis, the term metacomprehension will now be used when referring to 'metacognition' in the cognitive area of reading comprehension.

Metacomprehension may be considered as having four components:

a) an awareness of one's *knowledge* as it relates to reading comprehension at person, task, and strategy levels (e.g., knowing that print conveys meaning (task knowledge)).

b) an awareness of one's *on-going reading comprehension* (i.e., one's cognitive processing and interpretation of print).

c) the deliberate *selection and organisation* of one's knowledge about reading comprehension (e.g., knowing what one knows about reading and selecting from such knowledge the most appropriate

strategies to aid comprehension).

d) the deliberate *monitoring and regulation* of one's reading comprehension (e.g., responding to a failure in understanding by re-reading, or reading on in the text).

The present thesis is particularly concerned with b), c), and d), that is, the awareness which readers' have of their level of understanding whilst reading, and their ability to exercise control over their cognitive actions during reading by implementing appropriate strategies to facilitate understanding. Monitoring, self-regulation, and the selection and organisation of knowledge are therefore, central to the present definition of metacomprehension. As such, in devising an appropriate metacomprehension reading intervention programme an emphasis will be placed on enabling children to first of all, be aware of the need to monitor and regulate their reading comprehension, and then to encourage them to act discriminatively by using appropriate compensatory strategies to rectify comprehension problems.

Two important questions that arise from the definition and intervention aim, are:

1. how does one measure readers' awareness of their level of reading comprehension? and,
2. how does one measure readers' ability to select and organise appropriate reading strategies in order to monitor and regulate their comprehension?

The following section will discuss the issue of measurement, looking at the problems and solutions which have been offered by research in the area.

## 1.8 Assessing metacomprehension.

If metacomprehension is an awareness of one's knowledge and cognitive processing during reading, together with the control and regulation of such knowledge, then it would seem obvious that the most direct way of assessing this is to ask readers about their knowledge, and what strategies they are aware of using whilst reading. Similarly, asking readers ***why*** they chose one strategy as opposed to another should provide some insight into

the selection and organisation of their knowledge. The questions asked of readers might therefore address:

- what readers know about their reading comprehension (an indication of metacomprehension awareness of knowledge).
- what readers are aware of when understanding falters (an indication of metacomprehension awareness of cognitive processing).
- what strategies readers choose to *use* and *why*, when understanding fails to occur (an indication of deliberate selection, organisation and monitoring of reading).

Reader interviews, in the form of questionnaires, are a common measurement tool discussed in the literature and are possibly the most direct assessment of metacomprehension. However, it will be demonstrated that there are many technical and conceptual problems associated with their use. Generally, the measurement tools used to assess metacomprehension may be divided into direct and indirect methods.

Direct methods attempt to measure metacomprehension activity:

- as it occurs (e.g., think-aloud protocols)
- after it has occurred (e.g., retrospective interviews)
- or before it occurs (e.g., hypothetical scenarios of others' reading behaviour).

Indirect methods infer metacomprehension activity from cognitive performance. For example, error detection and cloze procedure are used as measures of metacomprehension because it is assumed that metacomprehension strategies are a prerequisite for successful detection of errors (in error detection), or missing word completion (in cloze procedure), (e.g., Paris, Cross and Lipson 1984; Ward and Traweek 1993). The most remote example of an indirect measure of metacomprehension is the comprehension test. Strictly speaking measures of comprehension represent the cognitive goal derived from the application of metacomprehension and cognitive strategies. Comprehension tests can only claim to assess metacomprehension if it is accepted that reading comprehension is dependent on metacomprehension behaviour.

The following will discuss direct and indirect methods of measuring metacomprehension, including for consideration the indirect measure of question generation. This is a unique application of the work by Raphael and McKinney (1983), and Gavelek and Raphael (1985) who were concerned with the relationship between question asking and answering. It will be argued that, indirect measures designed to *infer* metacomprehension behaviour from cognitive performance resulting from metacomprehension training, provide valid and observable dependent variables in the context of the present thesis.

### 1.8.1 Direct measures of metacomprehension.

One of the earliest methods of assessing metacomprehension was to use an interview strategy (Reid 1966). The general form of the interview has not changed much since Reid's early attempts, and tends to be constructed to measure readers' awareness of the dimensions of reading, (Johns and Ellis, 1976; Jacobs and Paris 1987), and/or their deliberate use of comprehension monitoring strategies (Myers and Paris, 1979; Gambrell and Palmer, 1992). Typically, the reader is asked questions which sample their knowledge of person, task, and strategy variables (viz. Flavell, 1979, 1981). For example, "What is reading?", "What do you do when you read?", and "If someone didn't know how to read what would you tell him/her that he/she would need to learn?" (from: Johns and Ellis, 1976). There are a number of problems associated with such approaches.

Firstly, it is not uncommon for studies using interviews as a measure of metacomprehension awareness to have a limited number of questions such as in the example provided above (i.e., Johns and Ellis, 1976). It is doubtful if such a small number of questions would be sufficient to sample the range of metacomprehension behaviours of which readers are aware.

Secondly, even with a larger number of questions such as that used by Myers and Paris (1978), there are methodological problems inherent in the construction of interview schedules. The order in which questions are asked may have significant effects on the responses provided, some questions acting as unintentional prompts for subsequent questions. Such a problem was noted by Canney and Winograd (1980) when replicating the

studies by Johns (1979), and Johns and Ellis (1976). By putting the general question *"What is reading?"* at the end of the interview, rather than at the beginning, Canney and Winograd removed what they referred to as a 'warm up effect' and significantly altered the results. Such a significant ordering effect led Moore (1982) to comment, *"The placement of critical questions in interview schedules would thus seem an important consideration in any attempt to understand children's metacognitive knowledge about reading"*

Thirdly, the analysis of responses from interviews is subject to experimenter bias, with little attempt being made in existing studies to standardise the construction of the interview, or the responses provided, despite the findings of Moore (1982). The use of independent judges, judicious ordering of questions, and repeated administration of interview questions with a wide and representative sample of children may overcome some of the above criticisms. However, even if such attempts were made, there are more fundamental conceptual problems with interviews.

Interviews are reliant on verbal self-reports about what children believe they know and do whilst reading. Such measures are dependent on children's linguistic skills and may therefore, reflect common patterns of children's language development rather than their metacomprehension attainments (see Thorpe and Satterly 1990). Such a difficulty is particularly pertinent when looking at young and poor readers who may not be able to express the knowledge which they have about their own mental processes because they do not have the appropriate vocabulary (see Cavanaugh and Perlmutter 1982). Conversely, good readers *"for whom reading processes tend to be automatic, and consequently less accessible to consciousness, tend to report their knowledge to an interviewer less fully"* (Ehrlich 1991). Both situations will produce unreliable results, failing to provide accurate measures of children's metacomprehension expertise.

It may also be the case that what children say they would do, or have done, bears little resemblance to what they actually do, or how they perform. Verbal reports may not therefore, relate to performance. *"Children who know perfectly well how to use a strategy or have the relevant prior*

*background knowledge, often fail to access it on appropriate occasions"* (Brown 1987). Children may provide very good verbal reports indicating advanced metacomprehension knowledge, but this knowledge does not necessarily translate into metacomprehension activity. Such a finding was reported by Kobasigawa, Ransom and Holland (1980) who found that 10 and 14 year old children could describe the strategy of skimming, but only the older children could use the strategy. Similar results have been reported by Pickens and McNaughton (1988) and Silven (1992), both of whom found that 12 year old, poor readers improved in comprehension and recall tests after metacomprehension training, but failed to demonstrate significant gains in verbalised metacomprehension knowledge tests. Children's inability to verbalise their metacomprehension knowledge is a crucial factor militating against the use of self-report measures.

Other difficulties with interviews have been succinctly summarised by Garner (1987), and paraphrased by Paris, Wasik and Van der Westhuizen (1989). Their criticisms relate to

- young children's difficulties in verbalising cognitive processes which are often implicit
- young children's difficulties in discussing hypothetical situations devoid of a meaningful context. For example, answering the type of question which begins, "What do you do when you are reading something and you come to a word you don't know?" (from Gambrell and Palmer, 1992)
- the fact that some verbal report data obtained from interviews are contaminated by the readers' rationalisations of what they think might have been going on in their heads, and a desire to please the examiner.

More recently, Ward and Traweek (1993) have noted seven methodological or conceptual flaws in the use of self-report data from interviews. In addition to those already discussed, they note that *"readers must be conscious of what thoughts they are experiencing while performing the task"*(in order to report on them), and that the *"task must be of enough complexity, difficulty, or novelty to evoke the necessity of metacognitive ability"*.

The afore mentioned problems call into question the validity and reliability of interviews as measures of metacomprehension. It is perhaps surprising that they continue to be used (e.g., Gambrell and Palmer 1992) often in a form little changed from that originally used by Reid (1966).

To try and overcome some of the methodological and conceptual problems associated with interviews, some researchers have used a think- aloud procedure. This method involves the reader verbalising their thinking processes as they occur in context. Such a strategy helps to remove the problem experienced by young children of commenting on hypothetical situations (Garner and Alexander 1989). It also avoids the methodological problem of question order, and unintentional cuing inherent in interviews. However, many of the difficulties described previously also apply to think-aloud measures. Once again, children's language skills are a confounding variable, possibly impairing their ability to report on mental processes which require a specialised vocabulary. In addition, the very act of verbalising an ongoing cognitive activity, interrupts the 'flow of thought', thereby interfering with the process. As Brown (1987) has commented, *"the requirement for overt verbalisation competes for central processing capacity with the processes that must be reported"*, thereby providing unreliable information. Conversely, the very act of thinking aloud may improve readers' metacomprehension by acting as a form of metacomprehension training (e.g., Baumann, Seifert-Kessell, and Jones 1992; Feitler and Hellekson 1993, Chapter 2). When used in a pre and post test design, the think-aloud measure may act as an independent variable, rather than a dependent variable, thereby contaminating the results.

The analysis of the protocols obtained from think-aloud procedures is also difficult, generating large amounts of data subject to misinterpretation, experimenter bias and problems of agreeing on appropriate categorisations (Rosenshine and Meister 1994). Some of these methodological problems could be overcome, by for instance, having independent judges mark the protocols. However, the conceptual problems related to children's language abilities, ability to report on hypothetical or retrospective situations and the tenuous relationship between reports about strategies and actual performance, continue to pose problems.

### 1.8.2 Indirect Measures of metacomprehension

Unlike the verbal self-report strategies described above which attempt to measure metacomprehension directly, there are other measures which infer metacomprehension from task performance. In such measures, the assumption is that in performing the (reading) task, children must apply metacomprehension strategies, and that improvements in task performance may be a reflection of the use of such strategies. Cloze procedure, error detection and comprehension tests are used as measures of metacomprehension because performance in each procedure is dependent on the application of metacomprehension strategies. The argument for using such inference measures is therefore, that:

1. performance in cloze, error detection and comprehension tests requires the application of metacomprehension strategies, and
2. each procedure is able to make internal cognitive processes (i.e., metacomprehension behaviour) accessible to investigation through measures of task performance.

The following discussion will describe and provide a rationale for each of the three indirect measures commonly used in empirical investigations of metacomprehension, that is, cloze procedure, error detection and comprehension tests. It will also describe and discuss the use of question generation as an additional indirect method not previously used in the research area but applied in the present investigation.

#### 1.8.2.1 Cloze Procedure/Tests

Typically, cloze procedure requires readers to read silently and provide the missing word(s) in a sentence so that it makes sense.

**For example:** A ------- hopped up on to my window. I ------- it a piece of bread from my -------. It then ------- back down and ------ away.

A 'correct response' is defined as a word which makes sense in the context of the sentence, paragraph or passage. In the above example correct responses could be respectively, 'robin', 'gave', 'hand', 'hopped', and 'flew'.

To perform proficiently in cloze procedure readers need to apply metacomprehension strategies; in particular, the self-regulation and monitoring of reading behaviour . For instance, in the above example readers may deploy some or all of the following strategies:

I. re-read the previous sentence
II. read on to the end of the sentence
III. look at where the missing word is in the sentence to ascertain the word type (verb, noun, article etc.)
IV. take cognisance of the story content and use their own previous knowledge and information about the subject to make a guess at the most appropriate word.

In choosing which of the above strategies to apply, readers need to behave discriminatively. They need to deliberately select and organise which of the above strategies to apply and when. They also need to monitor and regulate their reading comprehension as they decode so as to maintain the general sense of the sentence and/or paragraph. Finally, to perform in a cloze task readers must know to read for meaning. They must, therefore, have some metacomprehension knowledge about the demands of the task (i.e., that cloze procedure requires one to read for meaning, not to simply decode the words).

The strategies necessary to perform well in cloze procedure relate directly to those defining characteristics of metacomprehension described previously. Specifically, cloze procedure requires readers to:

I. be aware of the task demands and of the strategies which might help them to fill in the missing words (awareness of knowledge),
II. be aware of their level of understanding as they decode the words surrounding the missing word (awareness of cognitive processes)
III. select and organise their knowledge about the possible strategies necessary to find the missing word
IV. continually monitor and regulate their understanding across sentences and paragraphs so as to maintain the sense of the cloze passage/sentence.

The author would argue that cloze procedure requires readers to apply

metacomprehension strategies and is therefore a valid indirect measure of metacomprehension. In addition, since cloze procedure does not depend on verbal reports of internal processes, it is less subject to the criticisms made in relation to interviews and think-aloud measures. Readers demonstrate their metacomprehension skills by their successful completion of the cloze passage. They are not required to describe how they selected the missing words, the fact that they were able to, implies metacomprehension behaviour.

There are a number of methodological issues to consider when choosing appropriate cloze measures. Firstly, a decision needs to be made as to whether to use passages, or unrelated sentences. Some commercially produced cloze tests comprise individual, unrelated sentences (e.g., Edinburgh Sentence Completion Test: NFER Nelson), whilst others involve a paragraph of text in a short story format (e.g., Gap, McLeod 1970). The present author would argue that passages provide a better measure of metacomprehension because:

1. they are more representative of normal reading texts and therefore, of readers' experiences.
2. they are more demanding of readers' metacomprehension strategies, requiring them to read on and backwards in the text and to continually monitor and regulate their understanding of the text across sentences so that the whole passage makes sense, as well as the individual sentences.

In the literature to be reviewed and discussed in Chapter 2, it will be seen that where cloze procedure is used as a measure of metacomprehension, passages are used in preference to unrelated sentences (e.g., Pickens and McNaughton 1988; Paris, Cross and Lipson 1984).

A second methodological concern in relation to the selection of cloze tests is whether to use norm-referenced or self-produced tests. If norm-referenced cloze tests are used, as in Pickens and McNaughton (1988), then the difficulties related to the lack of standardisation of self-produced cloze tests are avoided. Whilst this may be desirable it is not always the case that researchers have used norm-referenced cloze tests (e.g., Paris,

Cross and Lipson 1984). In such instances, self-produced cloze passages have been constructed by the researchers using text from children's reading schemes and randomly deleting words. What constitutes as an acceptable response is determined by the test constructors. Data for each subject are in the form of an overall score representing the number of correct responses (i.e., the number of missing words filled in correctly). One of the problems with self-produced tests is that they have not undergone the rigorous standardisation procedures normally expected of norm-referenced tests. They may therefore have poor reliability, together with poor levels of external and internal validity. Norm-referenced cloze tests on the other hand, should provide a more reliable measure assuming that they have been appropriately standardised on a representative sample of children.

In the present research norm-referenced cloze tests using passages rather than individual sentences (Gap, McLeod 1970 (pilot study); and Gapadol, McLeod and Anderson, 1973) (main study)) were the preferred form of cloze procedure because of the reasons already outlined.

### 1.8.2.2 Error detection

As in the case of the cloze procedure measure, so the acceptability of the error detection method depends upon one's acceptance of the argument that the detection of errors is dependent on metacomprehension strategies. Typically, in error detection tasks, a passage is presented to the reader with no indication that there are deliberate miscues placed in the text. The miscues can be of several forms but all should distort the meaning of the sentence, paragraph or passage.

For Example:

> The man sit at the river's edge. He wad very cold, so he jumped into the water to cool down.

In this example there are a number of different types of miscues. There is a grammatical error where 'sit' is substituted for 'sat' (present tense substituted for past tense), a typographical error in the form 'wad' for "was', and the meaning is distorted by suggesting that he was very **cold**, when in

order to maintain consistency of meaning with the preceding clause, it should have read: "he was very **hot**".

It is assumed when using the error detection method, that for readers to be able to spot such deliberate miscues they must:

I. monitor their understanding of what they are reading as they proceed
II. integrate information from one sentence/phrase to the next
III. be aware of their knowledge of syntax in order to determine when a syntactical error has been made, and their knowledge of semantic rules and coherence to determine inconsistencies of meaning.

All of the above behaviours are examples of metacomprehension activity and should, therefore, make the use of the error detection method a useful behavioural measure of metacomprehension. Unfortunately, there are a number of problems inherent in the assumptions made about readers' non-reporting of errors. For example, if an error is not detected does this mean that readers have not spotted it, or that they have simply failed to report it, or that they have self-corrected and are therefore unaware of the error? The fact that readers tend to report more errors if they are told before reading that the passage has been violated, suggests that readers may be reluctant to report errors (Garner 1990; Oakhill 1995). This is particularly so for young and poor readers (Garner 1987), and has been referred to by Garner (1990) as the *"reluctance-to-expose-miscomprehension"* phenomenon. Such behaviour may be due to children's expectation that printed material provided by the class teacher should be intact. Conversely, it may be that children expect texts to be violated since this has been their experience (e.g., in badly produced worksheets), and as a result are unlikely to report errors (Fillmore 1982).

What ever the reasons for children not reporting errors, the fact that this appears to be the case, coupled with the problem of determining how many errors are self-corrected at an unconscious level and therefore not reported, makes error detection problematical as a measure of metacomprehension.

### 1.8.2.3 Comprehension tests

Unlike cloze and error detection measures, comprehension tests do not

assess *actual* metacomprehension behaviour. Instead, using Flavell's (1979; 1981) terminology, they measure the 'cognitive goal' derived from the application of metacomprehension and cognitive strategies. The underlying rationale for their use is based on the idea that, if metacomprehension strategies produce improvements in reading for meaning, then measures of reading comprehension are indicative of metacomprehension.

Two forms of comprehension measure are referred to in the literature:

1. 'self-produced' tests, and
2. norm referenced test

The term 'self-produced' refers to those comprehension tests which have been compiled by researchers for use as an outcome measure of intervention studies. They are usually constructed from reading passages taken from mainstream reading schemes and matched to children's reading ages. Importantly, self-produced tests of comprehension sample both literal and inferential understanding, and comprise a number of both types of questions (e.g., Palincsar and Brown 1984; 1987; Hansen and Pearson 1983).

The sampling of questions is important because of the different reading comprehension demands which each category of question is likely to place on readers. Literal questions, such as "What was the name of the boy in the story" are less demanding on readers' comprehension skills. The answers require little interpretation or integration of information across sentences and/or paragraphs. In the example provided, the answer is likely to be similar to the form of the question, that is: "The *name of the boy in the story* was Joe". Inferential questions such as "Why did Joe hit Laura?"are likely to need a greater amount of thinking, often requiring readers to draw upon their prior knowledge, and to integrate information across sentences and paragraphs (Pearson and Gallagher, 1983). Inferential questions therefore, demand more sophisticated reading strategies and make greater demands on readers' metacomprehension strategies as compared with literal questions. A wider metacomprehension knowledge about task demands and strategies is required of readers, which in turn places greater demands

on their organisation and selection of such knowledge. Additionally, to integrate information across sentences and paragraphs, readers require to constantly regulate and monitor their level of understanding as they proceed through the text.

In relation to the previous definition of metacomprehension (page 20), the answering of inferential questions as described above, requires readers to, regulate and monitor their ongoing comprehension and select and organise their metacomprehension knowledge about task demands and strategies.

Norm-referenced comprehension tests are generally poor at sampling inferential understanding, particularly older tests (Crowell, Au, and Blake, 1983). Also, the number of comprehension questions used to sample readers' understanding of a passage is usually small. For example, in the Neale Analysis of Reading Ability (Neale, 1989), used by Yuill and Oakhill (1988) as a measure of children's reading comprehension, and one of the more 'modern' examples of norm-referenced reading comprehension tests, there are only 3 comprehension questions (2 literal and 1 inferential) at the end of the first passage. More questions are asked as the reading age of the passages increases but the maximum number at the top end of the norms is still only 8 questions. For poor readers, who will never progress beyond the second passage because of the decoding demands, the test provides a particularly inadequate measure of their reading comprehension skills. The above criticisms also apply to the Gates MacGinitie (MacGinitie 1978), which appears to be the most frequently cited in the research literature.

Interestingly, metacomprehension intervention studies using norm-referenced comprehension tests as a measure of change, appear to produce insignificant results when compared with those studies using self-produced tests. In a review of the reciprocal teaching literature, regarded as an example of metacomprehension research (see Chapter 2), Rosenshine and Meister (1994) noted that, *"of 9 out of 16 controlled studies using norm-referenced reading tests as an outcome measure, only 2 produced significant results"*. This contrasts with the results obtained from studies using self-produced comprehension tests. In such circumstances, 6

out of 7 studies reviewed by them produced significant results. Similar findings to those of Rosenshine and Meister are reported by Paris and his colleagues (Paris, Cross and Lipson 1984; Paris and Oka 1986; Paris, Saarino and Cross 1986) in relation to their extensive research programme designed to improve children's comprehension through metacomprehension training.

A number of reasons could be given to explain the above findings. Firstly, it might be argued that self-produced comprehension tests sample a better range of question types (i.e., literal and inferential), and are therefore more likely to detect changes in performance. More importantly, they tap inferential levels of comprehension, which it has already been argued, are more demanding of readers' metacomprehension strategies. If controlled intervention studies are designed to teach children metacomprehension strategies in the pursuit of improved levels of comprehension, then a comprehension test which places demands on these skills is more likely to demonstrate change. It has been argued that norm-referenced tests are poor at sampling inferential understanding, which is the very level of comprehension most likely to require the metacomprehension strategies being trained in research programmes. Norm-referenced tests may therefore, fail to detect changes in metacomprehension intervention studies because they are poor measures of inferential understanding.

Secondly, the passages used in self-produced tests tend to reflect the type of passages used in real life classroom situations, and because of this may be more familiar to children, less threatening, and therefore more likely to produce positive results (Rosenshine and Meister 1994).

A third argument to explain the insignificant results obtained from the use of norm-referenced tests in metacomprehension studies has been offered by Paris, Cross and Lipson (1984). They argue that norm-referenced comprehension tests measure ability rather than specific knowledge and strategies related to comprehension. They note that *"the items generated to discriminate between students of varying abilities on reading, for example, are based on generalised traits ..."*. They go on to argue that standardised norm-referenced tests of reading comprehension may *"be particularly poor*

*instruments to measure instructional interventions in classrooms*". In other words, norm-referenced comprehension tests are not designed to measure the reading comprehension strategies which are being presented in metacomprehension training programmes. Despite this criticism of norm-referenced comprehension tests, Paris and his colleagues repeatedly used such tests in later studies (e.g., Paris and Oka 1986; Paris, Saarino and Cross 1986), resulting in insignificant changes being detected in reading comprehension (see Chapter 2 for details).

It would appear that norm-referenced comprehension tests may not be reliable as outcome measures when studying changes in comprehension performance as a result of metacomprehension training. This may be because of the way the tests are constructed, (i.e., to discriminate between different ability groups), or because of the over emphasis on literal understanding (Crowell et al 1983) with few inferential questions, or because of the contrived nature of the passages used in tests such as the Gates MacGinitie (1978). The balance of evidence suggests that a self-produced comprehension test which samples literal and inferential levels of understanding is likely to produce a more meaningful assessment of performance, resulting from metacomprehension intervention. As such, a self-produced comprehension test sampling literal and inferential levels of understanding is the favoured outcome measure for the present research. The exact nature of the measure is discussed in Chapter 4.

### 1.8.3 Summary of measures used to assess metacomprehension

It can be seen from the discussion that the measurement of metacomprehension is not easy. This is principally because researchers are trying to measure processes which are not directly observable. They occur internally, are ongoing, and subject to constant review, regulation and modification. The measurement of metacomprehension, as it occurs, is like trying to capture shifting sands, frequently eluding the empiricist. None of the measures used in the research area are ideal; however knowing their possible limitations should help to guide their future use.

The present thesis favours indirect performance measures, in particular the

use of the cloze procedure and comprehension test. The cloze procedure would seem to have face validity within the research area of metacomprehension, it provides observable and measurable outcome data, and is not, as in the use of think-aloud and interview methods, dependent on readers' ability to articulate complex internal cognitive processes of which they may not even be aware. Given that much of the intervention research, including the present study, is concerned with improving young and poor readers' metacomprehension, then poor linguistic competence is a particular problem for such studies.

The use of the comprehension test like the cloze procedure, is an outcome measure which produces observable and measurable data. It is not a direct measure of metacomprehension but rather, a cognitive measure resulting from the application of cognitive and metacomprehension strategies. However, one of the purposes of introducing children to a metacomprehension training programme is to help improve their comprehension. It would therefore, seem sensible to measure the 'cognitive goal' (i.e., improved comprehension) which should result from the application of metacomprehension strategies. If constructed appropriately so as to include inferential questions which, are more likely to require the application of metacomprehension strategies as compared with literal questions, then it should be possible to demonstrate changes in performance resulting from metacomprehension training. The hypothesis would be that greater gains in inferential, as compared with literal comprehension should result from metacomprehension training because of the reasons already outlined. A self-produced comprehension test taking into consideration the criticisms outlined in section 1.8.2.3 will be used in the pilot study, which will be discussed in Chapter 4.

The think-aloud and error detection methods will not be used as outcome measures in the pilot study not only for the reasons cited in sections 1.8.1 and 1.8.2.2 but also because both of these methods will be used as teaching strategies in the intervention programme (see Chapter 5). There is therefore, a danger that if the think-aloud and error detection methods are used for teaching purposes and again as assessment tools, then the results may only reflect what has been taught. Children will not be taught the cloze

procedure and therefore the same criticism can not be attached to this outcome measure. Children will be taught how to comprehend, but the strategies used will comprise the whole programme, thus there is not such a direct relationship between teaching and subsequent assessment as there would be if using the think-aloud and error detection methods.

As indicated previously, a third measure will be used in the pilot study, that of question generation. This will be a new measure not reported in the literature and is therefore unique in its proposed form and use in the present research. Section 1.8.4 provides a description of the method together with a rationale for its use. The construction of the measure will be discussed in Chapter 4

### 1.8.4 Question generation

Questions about a piece of written text vary in the depth of understanding or text comprehension necessary to answer them. In looking at the area of comprehension, Pearson and Johnson (1978) identified three categories of question:

I. textually explicit - the information needed to answer this type of question is explicitly stated within the text e.g., Q: What was the name of the dog in the story? A: The name of the dog was .....
II. textually implicit - the information needed to answer these questions must be inferred from the text requiring integration of different parts of the text e.g., Q: Why did the dog not open the door? A: Because it had been made sick from eating poisoned meat and couldn't move.
III. scriptally implicit - for these questions the reader is required to infer information from the text and relate this to prior background knowledge and/or experience e.g., Q: How do you think the owners of the dog felt when they discovered what had happened? A: I think the owners would have been sad and maybe angry.

Question asking and answering are common techniques used by the teacher in the class-room. Usually the teacher will ask the children a question about a text to assess their understanding. If they are unable to answer the question she will formulate another question with the expectation that the subsidiary question will provide a bridge for the

children to enable them to answer the original question. Bruner (1972) would describe this process as 'scaffolding'. In the class-room scenario the child's learning is directed by an external source; the teacher asks the question on behalf of the child, thereby acting as a "metacognitive surrogate" (Gavelek and Raphael 1985) for the pupil. Progress is made when pupils are able to deliberately formulate their own internal questions and answers about a text in order to aid their comprehension. A clear sign of developing metacomprehension is when children are aware of the importance of asking internal questions to monitor their understanding, and also know, not only how to formulate such questions but also when such a strategy will help their understanding. The above description demonstrates that children have metacomprehension knowledge of task and strategies and are aware of the need to monitor their own cognitive processes. Metacomprehension strategies are therefore achieved by the pupils' *"assuming increasingly greater responsibility in the questioning process"* (see Gavelek and Raphael, 1985).

By asking a question of themselves while reading, readers may be regarded as demonstrating metacomprehension strategies. Specifically, . they are using question generation as a means of keeping track of their ongoing understanding. The category of question which readers use may provide additional insight into the degree of sophistication of metacomprehension strategy development. The assumption being made is that the different categories of question identified by Pearson and Johnson (1978) involve readers in increasing levels of metacomprehension strategy development. For example, if readers ask a scriptally implicit question it may be assumed that there is an attempt on the part of readers to analyse the text beyond that which is explicitly stated, to make inferences and interpretations from what is alluded rather than stated, and to be aware that their own personal experience and knowledge can aid comprehension. All of these strategies demonstrate a high level of metacomprehension awareness of knowledge, together with the selection and organisation of such knowledge, and the deliberate monitoring and regulation of understanding. In contrast, if readers are only able to formulate a textually explicit question then, it may be assumed that they are operating at a literal level of interpretation, since the question asked of themselves would only

lead them into a literal analysis of text, which would require less sophisticated metacomprehension strategy development.

By asking readers to formulate and state questions about a text they have read and by analysing them using Pearson and Johnson's (1978) taxonomy, it should be possible to gain a further indirect measure of readers' metacomprehension development. The assumption is that scriptally and textually implicit questions are indicative of greater metacomprehension strategy development than textually explicit questions. It would be expected that as readers developed better metacomprehension strategies their level of comprehension would increase, this would be reflected in the type of questions which they formulated as a means of monitoring their understanding whilst reading. A move from textually explicit to textually and scriptally implicit questions would reflect increasing analysis of text and increasing metacomprehension development. The procedure for eliciting such questions will be described in Chapter 4.

Self-generation of questions as a means of self-interrogation would seem to be an appropriate measure of metacomprehension and worthy of exploration. One of its main difficulties as a measure is the fact that question generation will be taught in the metacomprehension training programme. It may therefore, be criticised for the same reasons as the error detection and think-aloud measures. However, the teaching of question generation will not correspond directly to the assessment measure. Children will need to assimilate and generalise a number of different but related skills to perform well in the question generating measure. They will need to know about the different types of questions and relate this metacomprehension knowledge to the different type of questions which they could potentially generate for themselves as a means of self-monitoring their understanding.

## 1.9 Summary of Chapter 1

Chapter 1 has addressed two important areas in relation to the study of metacognition as it applies to reading comprehension, namely, that of ***definition and measurement.***

In defining the concept for the purposes of the present thesis it was indicated that the term 'metacognition' might more precisely be referred to as 'metacomprehension', thereby serving to identify the particular cognitive area to which the generic term is being applied. Metacomprehension was considered as having four components:

> a) an awareness of one's *knowledge* as it relates to reading comprehension at person, task, and strategy levels
> b) an awareness of one's *on-going reading comprehension* (i.e., one's cognitive processing and interpretation of print)
> c) the deliberate *selection and organisation* of one's knowledge about reading comprehension
> d) the deliberate *monitoring and regulation* of one's reading comprehension (page 20).

It was indicated that monitoring, self-regulation, and the selection and organisation of knowledge were considered as central to the present study's conceptualisation of metacomprehension.

Given the defining characteristics of the concept, questions were raised as to how metacomprehension might be measured. The problem was identified as one of attempting to make observable what are essentially covert processes. In discussing the possible measurement tools it was suggested that those commonly used in the literature could be considered under two main headings:

- direct measures (e.g., structured interviews and think-aloud procedures), and
- indirect measures (e,g., cloze procedure, error detection, question generation and comprehension tests).

Direct measures were found to suffer from a wide range of methodological and conceptual problems such as poor linguistic competence, difficulties in categorising responses, ordering of questions in metacomprehension interviews, and the reliability of self-report data obtained from young and/or poor readers (Moore 1982; Cavanaugh and Perlmutter 1982; Thorpe and Satterely 1990; Ward and Traweek 1993; Ehrlich 1991).

Indirect measures were defined as cognitive performance measures of inferred metacomprehension behaviour. Such measures provide observable data which it was argued provides relevant quantifiable information regarding readers' metacomprehension development resulting from intervention.

Of the measures described it was indicated that the following would be used in the pilot study described in Chapter 4:

- a standardised cloze test involving passages rather than single sentences
- a self-produced comprehension test sampling literal and inferential questions
- a question generation test, new to the present study

Chapter 2 will begin to explore the research literature related to metacomprehension. In particular it will look at the application of theory to practice investigating the teaching of metacomprehension strategies to children. It will be demonstrated that little research has been conducted in Britain and that the use of multiple strategy programmes are generally limited, the most comprehensive being that of Paris and his colleagues (Paris. Cross and Lipson 1984; Paris and 1986; Paris, Saarino and Cross 1986).

# Chapter 2: *Literature Review*

## 2.1 Introduction

In Chapter 1 it was noted that the term metacognition was coined in the mid 1970's to describe individuals' self-awareness and self-monitoring of their cognitions and cognitive processes. When applied to reading comprehension it was stated that the concept might more precisely be referred to as metacomprehension. Metacomprehension refers to readers' abilities to reflect on, monitor, and evaluate their understanding as they read, and to apply appropriate correction strategies to overcome failures in comprehension. Behaviours such as previewing text, predicting, summarising, retelling, thinking-aloud, self-questioning, and reading on and back in the text to clarify meaning, might all be considered as metacomprehension strategies (see Schmitt and Baumann, 1990). Additionally, what children know about the above strategies is evidence of their metacomprehension knowledge (viz. Flavell, 1979).

The following review will discuss three areas of research which comprise the main foci of the literature in the area and reflect the above description of metacomprehension behaviour. The first area for discussion, and the focus of many of the earlier studies, is the metacomprehension ***knowledge*** children have about reading. The second concerns the ***self-monitoring and regulation*** which children deploy whilst reading, which Clark (1996) claims to be a *"central aspect of metacognition"* and which was previously indicated in Chapter 1 as an important area for the present research. The third focus relates to the ***application*** of metacomprehension theory to help promote children's understanding of text, specifically, narrative texts. The application of theory to practice is central to the present thesis and forms an important part of the review.

While each of the above foci will be reviewed separately, it is apparent from previous discussion that each area influences the other in a reflexive, interactive fashion. The headings might therefore, be

considered as artificial, however they provide a structure for the discussion and reflect the changing emphasis of research in the area. For example, in the 70's research was primarily concerned with what children knew about reading for meaning (e.g., Johns and Ellis, 1976; Myers and Paris, 1978), leading onto investigations of the self-monitoring and control of reading behaviours (e.g., Raphael and Pearson, 1985; Baumann, Seifert-Kessell and Jones, 1992), to the development of instructional approaches for teaching a broad range of metacomprehension strategies (e.g., Duffy, Roehler, Sivan, Rackliffe, Book, Meloth, Vavrus, Putnam, Bassiri and Wesselman, 1987; Cross and Paris, 1988; Lysynchuk, Pressley and Vye, 1990).

A central concern for each of the three foci of research has been the development of metacomprehension strategies according to age and reading aptitude. The questions posed are:

1. does metacomprehension develop and/or change with increasing age?
2. are there differences in metacomprehension development between good and poor readers?

Such questions are important when designing instructional programmes since the answers to them will influence when certain metacomprehension activities are taught to children of different ages and reading ability. In discussing the three areas of research, cognisance will be taken of the above two questions.

## 2.2 Children's metacomprehension Knowledge About Reading

Children acquire knowledge about various skills that are necessary for reading from a very early age. However, it is not always the case that they will use such knowledge to help aid comprehension. Additionally, whilst they may have knowledge about individual skills, children's understanding of the general nature of reading is less well formed, and appears to develop with increasing age and experience with print (e.g., Johns and Ellis, 1976; Myers and Paris, 1978; Paris and Myers, 1981; Gambrell and Palmer, 1992).

The following section investigates children's metacomprehension knowledge, that is, what are children aware of whilst reading? As the thesis is concerned with reading comprehension, those early studies investigating children's knowledge about reading at the simple word level, will not be reviewed, since the emphasis here is on the decoding aspects of reading (e.g., Downing and Oliver, 1973-1974; Ehri, 1975; Lundberg and Torneus, 1978). The reason for looking at children's knowledge about reading is to determine whether increased awareness of the purpose and function of reading affects comprehension. The question being posed is: do children know what reading is and does such knowledge influence reading performance?

### *2.2.1 What do children know about reading comprehension?*

The first person to attempt to analyse children's knowledge about the process and purpose of reading was Reid (1966). Twelve children, seven boys and five girls were randomly selected from a class of forty children in Edinburgh. Their ages ranged from 5 years 1 month to 5 years 5 months. She interviewed the children on three separate occasions during the course of their first year at school. The first interview comprised 4 questions, the second 3, and the third 2. All questions were different but were all designed to explore what children knew about reading. For example: *"Show me today's page. Can you read it to me? How do you know what it says?* (interview 2, question (b)), and *"What do you do if you don't know a word?"* (interview 3, question (a)). Reid discusses the children's responses to her questions in broad descriptive terms and concluded that the responses provided by the children suggested that they *'approached reading as a mysterious activity, to which they come with only the vaguest expectancies'* and *'were not even clear whether one read the pictures or the other marks on the paper'* (pp. 60 - 61).

Reid's investigation was a simple exploratory study and on its own can really only indicate what one group of children in Edinburgh knew about those aspects of reading which Reid chose to ask them about. Her analysis of the data obtained from the interviews was not structured in any systematic way. No attempt was made to categorise the children's

responses, thereby enabling the same criteria to be used in the analysis of each child's data. Additionally, because of the lack of structure to the data obtained from the interviews, it is difficult to determine whether or not there were any changes in children's metacomprehension development as they progressed through their school year. This problem is further exacerbated by the fact that the questions were different for each interview, and varied in number and complexity. In the examples already provided, it can be seen that question 3a comprised a single sentence, whilst question 2b was more complex containing three separate but related sentences. It might be argued that the different complexity of questions would have required differing degrees of linguistic competence, thereby introducing a confounding variable. The data may therefore, reflect children's problems in interpreting the questions than what they actually knew about reading. Finally, no rationale was provided for the choice of questions which appear to have been randomly selected by the investigator without any explicit statement being made about the theoretical underpinning. Despite these criticisms of Reid's methodology her study was the first of its kind to look at children's metacomprehension knowledge about reading, and possibly gave credence to the importance of investigating the subject. It is also one of the very few British studies.

Similar findings to those reported by Reid (1966) were later discussed by Clay (1973). Using similar question probes to those deployed by Reid together with books as physical, concrete aids, she looked at 5 year old school entrants in Australia to see what they knew about reading and print. Clay referred to such knowledge as 'concepts of print'. She reported that on entry to school, 66% of children did not know that print, and not the pictures told the story. After six months of schooling, 90% of the children had gained such metacomprehension knowledge. Such acquisition of metacomprehension knowledge is not surprising when one looks at children's school experience. It would be expected that as children progress through their early years of schooling they would be increasingly exposed to print and strategies for decoding. Children's declarative knowledge about reading should therefore increase and change with age and schooling.

Clay's study might be criticised for similar reasons as those already noted in relation to Reid (1966). However, a strength of her approach was the use of concrete materials which placed the metacomprehension interview questions within a meaningful context for the children.

A slightly more promising study in relation to the analysis of the data obtained from questioning children about their knowledge of reading is provided by Johns and Ellis (1976). They asked three questions of children aged approximately 5 to 14 years (N = 1655): "What is reading?"; "What do you do when you read?"; and "If someone didn't know how to read what would you tell him/her that he/she would need to learn?". It is possible to relate these questions to the later descriptions of metacognition supplied by Flavell (1979, 1981), and Paris, Lipson and Wixson (1983). Question 1 is a task/declarative one (i.e., do children know what reading is?), question 2 begins to look at the self-monitoring aspect of metacomprehension (i.e., are children aware of what they are doing whilst reading?), and question 3 is concerned with strategy/procedural knowledge (i.e., what strategies do children know about when they discover they cannot read?). It should be emphasised that the relationships being drawn with metacognitive research are interpretative on the part of the present author, since the work of Flavell (1979,1981) and Paris et al.(1983) would not have been available to Johns and Ellis (1976) at the time of their study. It is therefore, not possible to claim that Johns and Ellis' study was based on the metacomprehension literature pertinent to the present thesis, but it marks the beginning of a move within the empirical area towards a more structured approach to investigating children's knowledge about reading and for this reason is significant.

The children's responses to the three questions were classified into five categories. Categories 1 and 2 represented 'don't know' and 'classroom procedural type responses' (e.g., Q: "What is reading?" A 1, category 1: "Don't know" A 2, category 2: "Reading is workbooks"). Categories 3 and 4 represented respectively, decoding (e.g., "reading is sounding out the letters in words"), and meaning (e.g., "reading is getting information"). Category 5 represented decoding and meaning (e.g., "reading is working

out what words say (*decoding*) to get information (*meaning*)"). They found that the majority of children responded using categories 1 and 2. Only 15% of children defined reading as constructing meaning, and most of these responses were from the 13 to 14 year old students. A similar pattern of responses was found for questions 2 and 3. Reading for Johns and Ellis's sample of children was at best a decoding mechanistic process devoid of any search for meaning, at worst it was a mysterious process conducted in school. The children seemed to be unaware of the need to monitor their behaviour whilst reading and had a very limited repertoire of remedial reading strategies.

Canney and Winograd (1980) found a similar pattern of results to those of Johns and Ellis (1976) using a different methodology, and comparing good with poor readers. They presented good and poor readers (N =24) with modified and intact passages which were matched to the reading levels of the two groups of readers. The modified passages were altered graphically (all vowels omitted), semantically, syntactically and lexically (nouns and verbs randomly selected to replace nouns and verbs in the intact passage). The children were asked if each type of passage could be read and why. The aim of the investigation was to see if children were aware that reading was a meaning gaining activity and, if as a result of such knowledge, they would be aware that the violated passages were unreadable because of their distortion to the meaning. Both good and poor readers reported the intact passage as readable and the graphically altered one as not readable. The graphically altered passage, which had all vowels omitted from words (e.g., "Th- m-n/ c-m-/ t-/ th-/ h--s-" : "The man came to the house") emphasises the decoding aspect of reading. It might therefore, be concluded from the results that both good and poor readers were aware of the decoding aspects of reading. Without the vowels in words it would be difficult to decode them, thereby making the children believe that it was unreadable. In contrast, the other violations are meaning dependent, thus it is possible to decode the words but they make little sense because of the violations. In these situations only the good readers reported the passages as unreadable, suggesting that they were more influenced by the meaning of the text and more likely to have been monitoring and regulating their decoding as they progressed.

The assumption made from the study is that poor readers have less metacomprehension knowledge and awareness of the need to monitor and regulate their reading, than their better reading peers.

The two studies reported above suggest that young and poor readers perceive reading as a decoding exercise rather than as a means of gaining meaning from text. Unfortunately, the methodologies used in both studies provide only a crude insight into children's perception of reading. The complexities involved in learning to read require a more thorough analysis than can be obtained from asking children three simple questions such as: "what is reading?", or by presenting them with a number of violated passages and asking which are readable and why. Reading is a multifaceted skill dependent on factors such as text difficulty, motivation, and skill acquisition (e.g., sounding, recognising whole words). It is difficult to imagine that children, especially young or slow learning readers, would be able to articulate such subtleties without being prompted by more detailed questioning. The questions in Johns and Ellis' (1976) study may have been too broad to assess the finer details of what children may or may not know about reading. It might also be the case that the children's responses were limited by their linguistic attainments, the younger and poorer readers being at a greater disadvantage. A relative strength of Johns and Ellis' study was, however, their large sample of children (N = 1655), unusual in the research literature. Such a large sample may have helped to counteract the possible negative effects of differing linguistic attainments of individual children.

Canney and Winograd's (1980) study was not as dependent on self-reporting since it provided children with stimulus materials as a focus for their verbal reports, thereby giving them a physical prompt. However, their methodology is still limited in the range of reading skills and strategies which it is able to assess. Thus, detection of readable and non- readable material may provide a measure of whether or not children are aware of the psycholinguistic aspects of print, but it does not allow for a closer inspection of what children know of the influences of person, task and strategy variables on reading. Neither study allows one to

determine whether metacomprehension knowledge influences comprehension. If children are not aware of the function and purpose of reading, does this affect their ability to understand? Before going on to look at this question the review will report on an important study by Myers and Paris (1978) which was one of the first to draw specifically on the metacognitive literature and to use it as a theoretical underpinning to their investigation of children's metacognitive knowledge about reading comprehension (i.e., metacomprehension).

### *2.2.2 Children's metacomprehension knowledge about person, task and strategy variables*

Using Flavell's (1978) categorisation of the elements comprising "metacognitive knowledge" (i.e., person, task and strategy knowledge), Myers and Paris (1978) devised a structured interview designed to determine children's awareness of each of the above three variables on reading comprehension. **Person** variable questions sampled, for instance, children's knowledge about the effects of age, motivation and environmental limitations on the reading task (e.g., "The other day I talked to a boy who was really good at arithmetic. Then I asked him if he was a good reader. What do you think he said?"). **Task** variable questions were designed to measure aspects such as children's awareness of the effects of story length, structure and familiarity, (e.g., *"The whole class was going to read a story about New York. Ann was in New York last summer for her vacation. Do you think that the story might be easier or harder for Ann to understand than Jane who had never been to New York?"* (effects of familiarity)). **Strategy** variable questions measured things such as children's awareness of re-reading, skimming, imagery and comprehension monitoring. (e.g., *"If you had to read a story very quickly and could only read some of the words, which ones would you try to read?"* (skimming strategy)).

Two groups of children with mean ages 7yrs 9mths and 11yrs 9mths were asked 18 questions. When the group's responses were analysed apparent age differences were obtained. The younger children were less aware of the influences of structural and strategy variables on reading comprehension. In contrast, the older children were more aware

of the effects of the semantic structure of paragraphs, goals of reading, and strategies for resolving comprehension failures. No differences were found in relation to children's awareness of the influences of familiarity of texts, that longer stories take more time to read, that a story chosen by a child is usually easier to read than one chosen by a teacher, and that re-reading can aid comprehension.

Young children seem to have some knowledge about the more general aspects of reading, but are limited in relation to the more complex and specific influences. Myers and Paris concluded that: *"A general implication of children's responses in the present study is that second graders* (7 to 8 year olds) *perceive reading as an orthographic-verbal translation problem rather than as a meaning construction and comprehension task".*

Apart from the methodological criticisms already noted above, together with those outlined in Chapter 1 about verbal reports and interview methodologies, Myers and Paris' (1978) investigation might be regarded as a major advance in the empirical investigation of children's metacomprehension knowledge and awareness. Importantly their investigation had a structure drawn from the metacognitive literature. Their questions were guided by Flavell's (1979; 1981) concept and definition of metacognitive knowledge, and the responses obtained from the interviews were analysed according to this definition. Such structure to the design and analysis of the questionnaire also led to more reliable marking of responses by independent judges , since both could use the same criteria as defined by Flavell (1979; 1981). Myers and Paris quote "fewer than 2% disagreements" between judges in their analysis of children's responses. Furthermore, Myers and Paris go on to indicate that the disagreements were resolved until 100% concordance was achieved, thereby negating the original 2% disagreement.

A sound theoretical framework to the production and analysis of questions would seem to be a major strength of Myers and Paris' work. Additionally, a relatively large number of questions were used in their interview, providing extensive amounts of data for investigation and

probably producing a more representative sample of children's knowledge about person, task, and strategy variables. Ironically, what is a strength, (i.e., the larger number of questions) may also be a weakness since a greater number of questions are more likely to cause ordering problems such as those reported by Moore (1982). Thus, some questions at the beginning of an interview could act as prompts for later questions.

The ordering effect of questions in structured metacomprehension interviews was investigated by Moore and Kirkby (1981) in a replication of Myers and Paris's study. They changed the order in which the strategy and task questions were asked and found like Myers and Paris that the younger children demonstrated an ***awareness*** of such things as familiarity of text and re-reading as important aspects of reading, but may not have been able to ***use*** such knowledge to help aid comprehension. It would seem that Myers and Paris' ordering of questions had made a difference to children's responses about strategy use. An ability to demonstrate knowledge verbally does not necessarily translate into being able to apply such knowledge, when appropriate, with a view to improving comprehension.

Moore and Kirkby's (1981) distinction between *knowledge of* strategies as distinct from their *use* is also reported by Kobasigawa, Ransom, and Holland (1980). They found using a metacomprehension interview methodology, that both 10 and 14 year olds could *describe* the strategy of skimming, but when observed reading, only the 14 year olds could *use* skimming as a strategy. Kobasigawa et al.'s study, like that of Moore and Kirkby (1981) suggests that younger children may be aware of some strategic aspects of reading and can verbalise such strategies, but do not actively use such knowledge.

The studies reported and the results obtained demonstrate the problems in simply obtaining verbalised reports from children about what they know about reading comprehension. What children report they know about reading, may not be all of what they know, and what they report may not be used to improve comprehension. Despite such flaws, the

metacomprehension knowledge studies are important since they provide some insight into what children appear to know about their cognitions and cognitive processes in relation to reading comprehension. Such information has been useful in informing the content of instructional programmes.

To summarise, the above studies tend to suggest that there are differences with age in children's knowledge of, and awareness about, the reading process. Such development is reflected in a gradual progression from an over-emphasis on the decoding and mechanistic aspects of reading, to the influences of variables related to the extraction of meaning. What remain unclear are the developmental mechanisms which move children from being relatively unsophisticated in terms of their metacomprehension knowledge, to having well developed metacomprehension knowledge bases. It might be argued that much of the movement may be accounted for by children's instructional experience. Weight to such an argument is provided by those metacomprehension knowledge studies which look at differences between good and poor readers. When the results from these studies are viewed in combination with those already described, then the influence of instruction on the development of metacomprehension knowledge becomes clearer. A fuller discussion of this relationship will therefore be provided at the end of the following section.

### 2.2.4 Good and poor readers' metacomprehension knowledge about reading

#### *2.2.4.1 Definitions of good and poor readers*

Before looking at some of the empirical studies related to the above topic it is helpful to discuss what is meant by good and poor readers since the definition of these groups of readers has not always been made explicit by researchers. Such lack of clarity has the potential for confusion and misinterpretation of results particularly when trying to compare studies. Many of the studies looking at good and poor readers either fail to define what they consider to be a good and poor reader, or do not report the criteria on which the children were selected. In some studies 'poor'

relates to comprehension (e.g.,Wong and Jones, 1982); while in others it is a combination of decoding and comprehension (e.g., Feitler and Hellekson, 1993). Given that it is difficult to disentangle the mechanical aspects of reading from a person's ability to extract meaning (for instance: the psycholinguistic aspects of decoding rely on the use of syntax and context, both meaning clues), one might assume that 'poor readers' are poor at both decoding and understanding.

Children with poor mechanical and comprehension reading skills are perhaps the most common group identified within class-rooms and referred to as 'poor readers'. In contrast, when one finds children who have age related decoding skills but poor comprehension, then it may be argued that a different and more specific type of problem is being experienced (i.e., hyperlexia). A further sub-group of 'poor readers' might be children who have poor inference skills but can cope with literal levels of interpretation. However, some may argue that the ability to infer is a determinant of 'good comprehension', differentiating 'good' from 'poor' comprehenders.

In addition to the problem of definition, there are also concerns about the measurement of good and poor comprehenders. In those studies where comprehension skills have been assessed pre-intervention, a standardised norm-referenced reading test such as the Gates MacGinitie (MacGinitie, 1978) has been used. The problems associated with norm-referenced comprehension tests have already been discussed in Chapter 1, however it is perhaps worth highlighting again that one of their major limitations is the way in which they are calibrated to differentiate between levels of reading ability which some might argue (e.g., Paris, Cross and Lipson 1984; Rude and Oehlkers, 1984), is highly correlated with intellectual ability. As Rude and Oehlkers (1984) note in relation to comprehension tests:

*"In an attempt to maximise the spread of scores and differentiate among students, test questions have been included which load heavily on the same factors found in intelligence tests. As a result, the reading tests have come to resemble intelligence tests, making it difficult for instructional programmes to raise test scores substantially."* (Quoted in

Paris et al., 1984 p. 1249)

If a standardised reading comprehension test is used to identify good and poor readers it may be that what is being selected are in fact high and low ability children. The whole issue of good and poor readers, and the subsequent evidence is therefore fraught with problems of interpretation and measurement. It would seem that defining what one means by good and poor readers is important not only to ensure clarity regarding which group(s) of children are likely to benefit from intervention but also to enable comparisons to be made across studies.

The studies to be discussed in the following section define good and poor readers in relation to their comprehension scores as determined by a norm-referenced comprehension test, normally the Gates MacGinitie (MacGinitie, 1978). One must assume that the children's decoding skills were age related, although this is not stated. The findings from the research should therefore be interpreted within the context of the definitional problems outlined.

#### *2.2.4.2 Good and poor readers' metacomprehension knowledge about reading*

The same differences in metacomprehension knowledge as those obtained for young and old readers are found when good and poor readers are compared. Paris and Myers (1981) compared good and poor readers with a mean age of 9yrs 5mths and matched for age, sex and arithmetic achievement. The groups were selected on the basis of their comprehension ages as measured by a standardised reading comprehension test (Gates MacGinitie Reading Test, MacGinitie, 1978). The children were given a narrative text to read and their strategic reading behaviours were noted whilst they read. They were also asked to recall the passage and this was tape recorded and transcribed by the researchers. The transcripts were marked by independent judges who were asked to identify the number of main ideas reported by the children. Agreement levels of 90% were noted for this part of the analysis. In addition the children were asked to rate on a 9 point scale how useful to their comprehension of the passage they would find 25 reading

strategies identified by the researchers. The strategy questionnaire was constructed so as to have equal numbers of 'positive and negative internal' strategies, together with five neutral strategies. An example of a positive internal strategy would be "asking oneself questions about the passage", and a negative internal strategy would be " sounding out all the words".

Paris and Myers (1981) found that there were no significant differences between good and poor readers on the neutral items of their strategy questionnaire, but found that good readers were aware of significantly more positive internal strategies, than the poor readers. Like the younger readers in the studies reported previously, the poor readers were less sensitive to the structural and strategic aspects of reading, tending to focus on reading the words, rather than reading for meaning.

They also found a significant correlation between the number of positive internal strategies reported by readers and recall of main ideas. Thus, good readers appeared to know more about reading strategies, and had better recall of text information. Whilst causality of the relationship between metacomprehension knowledge and performance cannot be determined from correlational data, Paris and Myers' (1981) study indicates that there is an association between metacomprehension knowledge and comprehension performance which could be usefully investigated using a more robust statistical and/or experimental model. Such an empirical investigation was undertaken by Paris and Jacobs (1984), to be discussed later, which has provided more conclusive evidence of the association between metacomprehension knowledge and comprehension.

The findings reported in relation to young and old, and poor and good readers tend to suggest that there is a development in metacomprehension knowledge with age and reading achievement. It was stated previously in relation to young and older readers that such development may reflect children's instructional experiences. This hypothesis is further corroborated by the evidence provided by research reporting on the development of good and poor readers'

metacomprehension knowledge. The argument depends on one's acceptance that good and older readers are likely to experience similar curricula experiences as are young and poor readers, the former's instruction concentrating more on strategic reading, the latter on decoding (see Garner and Kraus, 1982,). Further more, older and more competent decoders of print are likely to be more fluent readers as compared with young and poor readers, resulting in greater enjoyment from reading, and thence a different perception of the ultimate goal of reading- to gain information and understanding (Garner, 1990). To summarise the anecdotal evidence, reading competence is likely to influence one's perception of reading, thereby affecting the declarative metacomprehension knowledge base of readers. Reading competence will also influence the amount of reading exposure, thereby providing more opportunity to learn about the function and purpose of reading. Thus, reading instruction influences children's reading experiences in terms of the amount and quality of reading. Such experiences are likely to be similar for good and older readers, and for poor and young readers.

One of the few studies to provide some empirical evidence of the relationship between different instructional experience and metacomprehension knowledge outcomes is provided by Gambrell and Palmer (1992). Using a metacomprehension interview methodology based on Myers and Paris's (1978) work but including questions on reading and writing, Gambrell and Palmer randomly selected 157, 7 and 8 year old children from two schools in America. In one school a literature based programme (i.e., an integrated whole language approach) had been used to teach children reading and writing skills. In the other school a more traditional basal reading scheme was used. They interviewed the children in years 1 and 2, and found significant differences in reported metacomprehension knowledge between those children in the literature based programme and those in the basal reading programme. The children in the literature based programme demonstrated statistically more strategic knowledge in relation to the question *"What do you do when you come to a word you don't know?"*, than the basal reading scheme children. By year two the differences were greater, with the literature based children demonstrating more task,

strategy and person knowledge. Putting to one side the criticisms already made in relation to verbal report and interview methodologies, Gambrell and Palmer (1992) provide some evidence beyond the anecdotal, that instructional experience makes a difference to metacomprehension development, and that such differences increase with exposure to print and/or practice in reading for meaning. As Gambrell and Palmer note, *"It may be that children in literature based programmes spend more time reading"* and are therefore afforded more opportunity to develop and practice metacomprehension strategies.

Research looking at differences in metacomprehension knowledge with age and reading aptitude would seem to provide a significant amount of convergent data indicating that young and poor readers have similar gaps in their metacomprehension knowledge. Questions of interest to the researcher, but as yet unexplored are:

1. does a lack of metacomprehension knowledge affect children's comprehension performance?
2. can children be taught to improve their metacomprehension knowledge?

The first question will be examined in the following section. The second relates to instruction of metacomprehension strategies and will be considered later.

### *2.2.5 The relationship between metacomprehension knowledge and comprehension performance*

If readers have more metacomprehension knowledge, are they better comprehenders of text? This is an important question for practitioners since it has implications for what is taught to children and when. Paris and Jacobs (1984) are unique in looking at this specific question. Their experimental design combined an interview methodology to obtain measures of metacomprehension awareness, together with an instructional intervention designed to teach children metacomprehension strategies. The following discussion will concentrate on those aspects of the study which investigated the relationship between metacomprehension knowledge and reading comprehension.

Two groups of children (mean age 8yrs 5mths and 10yrs 5mths) were given a metacomprehension interview to determine their level of reading awareness. Reading awareness was defined as: "*the knowledge that children report about that domain*"(i.e., reading) and focused on their awareness of three broad categories of reasoning skills, namely, evaluation, planning and regulation. The interview questions were constructed from 33 Lickert-scaled items and 19 open ended questions. To avoid response bias, a potential problem of interviews previously discussed, the 19 open ended questions were interspersed within a conversational script. From the 19 questions,15 were used in the final analysis. The 4 omitted questions provided uninformative responses from the children. The responses from the open ended questions were categorised and scored by independent judges, yielding overall agreement levels of 90%. The children's reading awareness score was compared with their pre-test scores on the Gates MacGinitie Reading Test (MacGinitie, 1978), and on self-produced cloze and error detection tests. Significant pre-test correlations were found between children's metacomprehension knowledge and their performance on all three measures. Paris and Jacobs found that children who were more aware of the nature of reading tasks and strategies as determined by their metacomprehension interview score, scored more highly on tests of reading comprehension. Generally, the older children (10 year olds) scored more highly on the metacomprehension knowledge measure ($p<0.001$), as compared with the younger children, demonstrating a stronger correlation between performance and reading awareness for this age group.

The results are perhaps not surprising for the cloze and error detection measures since, as argued in Chapter 1, these tests require the application of metacomprehension strategies. One would therefore, expect to find a relationship between awareness and performance on these particular tests. However, the comprehension test is a measure of the cognitive goal of reading, and hence significant correlations on this measure might be regarded as more meaningful, suggesting that metacomprehension knowledge about reading is an important influence on children's ability to comprehend.

Correlational data are difficult to interpret, providing only tentative evidence that a relationship exists but nothing conclusive about the causality of the relationship. However, Paris and Jacobs' study goes on to look more closely at the association between metacomprehension knowledge and understanding, and in this respect is unique to the research literature in the area. To see if different levels of reported metacomprehension knowledge produced different degrees of understanding, Paris and Jacobs created three post hoc groups of children from the interview data. The three groups comprised children with low, medium and high metacomprehension knowledge. Chi-square tests revealed comparable numbers of 8 and 10 year olds in each level of awareness, except the highest, in which there were 16 younger and 34 older children. From the results discussed previously which related levels of metacomprehension awareness with increasing age, this would be expected.

Each groups' performance on the Gates MacGinitie (MacGinitie, 1978) reading test, cloze and error detection tests were compared. It was hypothesised that children with high awareness would perform better on each of the dependent variables than those with low and medium awareness. Significant differences were found between level of metacomprehension knowledge and performance, with high knowledge groups out performing low and medium knowledge groups.

It would appear from this study that level of metacomprehension knowledge has an effect on comprehension performance. Unfortunately, Paris and Jacob's measures of performance are muddied by the fact that cloze and error detection procedures rely on the application of metacomprehension strategies and are therefore not pure outcome measures of comprehension. Furthermore, the Gates MacGinitie Reading test provides only a crude general measure of comprehension, failing to differentiate between literal and inferential comprehension. It is also influenced by ability and, consequently, positive results on this measure may reflect a relationship between metacomprehension knowledge and intellectual attainment.

Despite the above criticisms, Paris and Jacobs' (1984) investigation provides reasonably strong evidence that there is a positive relationship between metacomprehension knowledge and performance. Additionally, their results would suggest that such knowledge increases and becomes more sophisticated with age, producing increasing effects on comprehension performance.

Further evidence of the relationships between age, metacomprehension knowledge and comprehension performance is provided by Cross and Paris (1988). Their experimental design and analytical tools were more sophisticated than that deployed by Paris and Jacobs (1984). They used a cluster analysis technique to identify subgroups of readers within their sample of children. One major advantage of using cluster analysis is that it provides multivariate rather than bivariate correlation coefficients, thereby avoiding some of the criticisms of Paris and Jacobs' study. Using the same interview schedule and dependent measures as described by Paris and Jacobs (1984), they compared children's pre-test scores on the interview and comprehension measures between the ages of 8 and 10 years thereby creating a longitudinal set of data over a two year age span. They found that there was a general trend for metacomprehension and strategic reading to become more congruent from 8 to 10 years of age. Thus, the younger children showed less of a relationship between increased reading awareness and performance as compared with the older children whose reading comprehension correlated more closely with their metacomprehension. Such results were obtained after the implementation of an experimental curriculum designed to enhance children's metacomprehension awareness and comprehension reading strategies.

### *2.2.6 Summary of metacomprehension knowledge studies*

All of the studies reported have looked at children's metacomprehension knowledge. The common methodology for investigating this aspect of metacomprehension has been to use an interview strategy comprising a number of questions designed to tap children's reported awareness of different aspects of reading. Studies demonstrate increasing levels of sophistication in terms of the structure of interviews (e.g., in terms of

content, question order, and number of questions asked), the recording and scoring of children's responses to interview questions, and the analytical statistical tools used to measure change. Additionally, the questions posed have become more subtle and related to instructional issues. Thus, the questions for investigation have shifted from simply, *what do children know about reading?* (e.g., Reid, 1966; Johns and Ellis, 1976) to, *what do children know about person, task and strategy variables?* (e.g., Myers and Paris, 1978; Moore and Kirkby, 1981), to *what difference does what children report they know about reading make to their comprehension of texts?* (e.g., Paris and Jacobs, 1984; Cross and Paris, 1988).

Notwithstanding the problems associated with interview and verbal report methodologies, the data provided from the metacomprehension knowledge studies suggests that:

- metacomprehension knowledge changes with age and reading aptitude: older readers' knowledge more closely resembles that of good readers, whilst poor readers' knowledge more closely resembles that of younger children
- level of metacomprehension knowledge seems to have an effect on comprehension performance: the more metacomprehension awareness the reader has, the better their comprehension is likely to be

If the conclusions drawn from the studies described are accurate, then an important pedagogic task would seem to be to teach children metacomprehension strategies at person, task and strategy levels. It would be expected that if a relationship does exist between metacomprehension knowledge and comprehension performance, then teaching young and poor readers such information should result in improved comprehension. The application of what is known about children's metacomprehension knowledge, as indicated by the studies already reported will be returned to later when discussing the application of theory to practice. First it is important to look at the second aspect of children's metacomprehension, that is, readers' ability to self-monitor and regulate their understanding of text.

## 2.3 The Development of Self-Monitoring behaviour

As indicated in Chapter 1, self-monitoring is an essential aspect of reading for meaning. It is an important component of metacomprehension since it indicates to readers that they should take remedial action to rectify a potentially confusing situation. Without self-monitoring the reader would continue to read, and would effectively be 'barking at print'[1]. Consider what happens when one is reading (the foregoing perhaps), it is possible to reflect that, in order to keep track of the message being conveyed, one must be regulating one's behaviour reading. On the basis of such regulation, one may continue to the print decode, or stop and apply a number of metacomprehension strategies (such as re-reading, asking a question of one's self, or reading on, with the possible benefit of clarification). Hopefully, the present reader will have experienced this very behaviour since there were deliberate errors in the present paragraph (i.e.,'behaviour reading' and 'to the print decode')! In order to ensure that one reads with understanding it is necessary to continually monitor one's progress whilst reading.

The importance of self-regulation whilst reading was commented upon by Holt as early as 1964 when he noted:

*"Part of being a good student is learning to be aware of one's own mind and the degree of one's own understanding. The good student may be one who often says he does not understand, simply because he keeps a constant check on his understanding. The poor student who does not, so to speak, watch himself trying to understand does not know most of the time whether he understands or not. Thus the problem is not to get students to ask us what they don't know; the problem is to make them aware of the difference between what they know and what they don't" (pp. 28-29).*

Given that self-monitoring is so important in the process of reading for meaning it is unfortunate that young and poor readers do not appear to actively deploy such strategies (Garner and Kraus, 1982; Garner 1990; Malone and Mastropieri, 1992). The research evidence parallels that of

[1] 'barking at print' is a term commonly used by teachers to mean decoding without understanding

the metacomprehension knowledge studies, leading investigators to conclude that self-monitoring strategies need to be explicitly taught to children (Bereiter and Bird, 1985; Baumann, Seifert-Kessell and Jones, 1992). The following section will review those studies which have specifically looked at whether or not children are able to self-monitor their reading behaviour. The empirical research to be presented occurred during the late 1970's and early 80's. More recent investigators have accepted the evidence provided by their predecessors and concentrated on teaching children how to self-monitor. The fact that self-monitoring can be taught to young and poor readers with demonstrable improvements is evidence in itself of the earlier findings.

### *2.3.1 Self-monitoring and the detection of inconsistencies*

The typical research paradigm for looking at readers' self-monitoring behaviour has been to observe their reactions to violated texts. Deliberate errors are inserted into text, the premise being, that if children spot the errors then they must have been monitoring their reading behaviour and attending to meaning. The most documented research in this area is that of Markman (1977; 1979). Whilst her studies involved listening to, rather than reading texts, the results together with the methodology (i.e., error detection) have provided the basis for future investigations in the area and are therefore, worthy of review.

In Markman's first study children aged 6 to 7 years and 8 to 9 years were asked to listen to some instructions about how to play a game or perform a magic trick. Important information was omitted from the instructions, rendering them useless in respect of informing the children how to perform. The measure of whether or not the children noticed the incomprehensibility of the instructions was if they asked the investigator for more information, or indicated that the information provided was not sufficient to complete the game. The point at which the children indicated the need for more information was recorded. Markman found that the younger children were only aware that they had incomplete information when they attempted to carry out the instructions. The older children spotted the errors more readily, although some had similar difficulties to the younger group. Markman (1977) concluded that the younger

children had failed to evaluate whether or not the instructions made sense whilst they were listening.

Markman's first study provides some insight into children's self-monitoring behaviour in a problem solving situation and with aurally presented information. The learning context (i.e., problem solving) and mode of presentation (i.e., aurally) is different from that experienced by listeners to, and readers of, print. It may be argued therefore, that Markman's results are not transferable to situations involving the independent reading of text. This is a particularly strong argument if one accepts that metacognition is domain specific as argued in Chapter 1.

In Markman's (1979) second study the stimulus materials were short stories and the aim was to look at textual inconsistencies. This study is more representative of what children may do when reading independently, although direct comparisons between these two conditions (i.e., listening to print being read, and reading independently) can not be assumed, and indeed may be quite different (see Garner 1990).

Children aged 8 to 12 years were asked to listen to short essays all of which contained inconsistent information. For instance, in a passage about fish at the bottom of the ocean, there were two contradictory statements made in two concurrent sentences:
*"They **cannot** even see colours. Some fish that live at the bottom of the ocean **can** see the colour of their food; that is how they know what to eat"*

After having listened to the stories the children were asked questions which were designed to evaluate whether or not they had been aware of the inconsistencies. For example, in the above extract they were asked: *"Can fish see?"* and, *"How do fish know what to eat?"*.

Markman found that all of the children had difficulties spotting the contradictions in the essays; however if they were prompted before they heard the essays by being told that there were some inconsistencies in the stories, the older children (11 to 12 years) improved their

performance. In addition, Markman (1979) found that children were more likely to spot inconsistencies which were in single or adjacent sentences, than if there was intervening text. This suggests that whilst older readers with prompting can monitor their understanding of single sentences, they still experience problems when they have to evaluate and integrate information across a number of sentences. Such difficulties could result from poor working memory. The further apart the inconsistent information, the more that needs to be stored in working memory, and the greater chance of overload. Oakhill (1984) comments on this factor in relation to children's difficulties in making inferences which require the integration of information across paragraphs as compared with adjacent sentences. Such problems could be more significant for younger children who may also be struggling with the vocabulary and syntax of the story, both of which would add to the amount of information processing required. What appears as a failure to self-monitor may in fact be a failure of working memory and/or cognitive overload. One way of reducing such a problem is to provide children with the texts for reference rather than asking them to listen and remember. If the text is available for readers to inspect, then large amounts of information do not need to be held in auditory working memory since readers can reinspect the text by reading on and back through the passage and visually scanning for information which appears inconsistent. The use of texts for reading independently may therefore produce different results because of the different cognitive processing and storing of information which print may induce.

Garner and Taylor (1982) provide one typical example of error detection and self-monitoring using text material independently read by children. They asked children aged between 7 and 12 years to edit passages which contained inconsistencies. In editing the passages the children were able to work with the texts and could theoretically have deployed self-monitoring strategies together with re-reading, reading on and skimming and scanning to remediate problems encountered from the inconsistencies in the text. Even with the text for reference, it was found that the younger the reader the less able they were to detect errors. Similar results to those found by Garner and Taylor have been reported

by others using very similar materials and modes of presentation (e.g., Baker, 1984; Winograd and Johnston, 1987).

The above studies all report younger children failing to detect inconsistencies in text. Such difficulties appear to occur both when listening to text being read (e.g., Markman, 1978) and when reading independently (e.g., Garner and Taylor, 1982). If the hypothesis related to children's working memory is accurate one might predict that the listening condition would place greater demands on working memory than the reading condition, since in the latter condition the children could use the text to refresh their memory. The results from both listening and reading studies are however the same, indicating that something other than working memory is responsible for children's failure to report inconsistencies.

An alternative explanation of children's failure to report inconsistencies might be found in the methodology used to measure children's responses to violated texts. Do children fail to spot errors, or do they simply fail to report them? Alternatively, do they spot errors and adeptly apply fix up strategies to self-correct, thereby being unaware of having detected an error? Such questions can not be conclusively answered by the research reviewed. However, if children's failure to detect inconsistencies in text is due to a lack of self-monitoring then one would expect that instruction in self-monitoring should produce positive gains in children's ability to detect inconsistencies in text. It will be shown later in the discussion that instructional studies investigating this research problem have demonstrated that children can be taught to self-monitor with the effect of increasing their ability to detect inconsistencies in text (e.g., Baumann, Seifert-Kessell and Jones, 1992).

### *2.3.2 Good and poor readers' detection of inconsistencies and self-corrective behaviour*

A similar pattern of results to those described above is demonstrated in comparisons between good and poor readers' ability to self-correct. The ability to self-correct depends on keeping track of the meaning of a text and is therefore related to self-monitoring. If one was not self-monitoring

the meaning of a sentence, then there would never be a need to self-correct, since one would not be aware of making an error. Self-correction might be regarded as an implicit behavioural measure of self-monitoring. Clay (1973) found that good beginner readers corrected 33% of their own reading errors as compared with poorer readers in the same class who self-corrected only 5%. In a more detailed study of children's self-correcting behaviour, Weber(1970) found that good and poor readers aged 6 to 7 years, self-corrected the same number of grammatically acceptable errors, but that good readers were twice as likely to correct grammatically incorrect errors, demonstrating a qualitative difference. Similar problems are encountered by poor readers when presented with inconsistencies in texts (Paris and Myers, 1981). Paris and Myers asked good and poor readers (aged 9 to 10 years) to read aloud passages which contained nonsense words and phrases, and were told to underline anything in the text which did not make sense. Prompting increased the amount of underlining as compared with the condition without prompting but poor readers still detected less than half of the errors.

The reason for poor readers' failure to underline nonsense words is assumed to be because they are poorer than good readers at self-monitoring their reading behaviour. This may not be the whole picture, especially since we have already seen that all readers have difficulties with this behaviour. It might be argued that poor readers' inability to detect inconsistencies is due to their limited vocabulary, possibly resulting from their lack of exposure to print. If readers' vocabulary is limited then they may not be aware that certain words which they are capable of decoding, are in fact nonsense words. Additionally, poor readers may have a history of repeated failure which could inhibit them from underlining words that they suspect are non words but because of their lack of confidence, they are reluctant to commit themselves to underlining for fear of further failure. What appears as an inability to detect errors may in fact be due to a combination of confidence and limited vocabulary knowledge. One way of trying to untangle such confounding variables is to simplify the language content of the passages, ensuring that the vocabulary and syntax is within the

capabilities of the readers.

Paris and Myers (1981b) repeated their study but this time used simplified passages as described above. When the passages were simplified the poor readers were more able to spot errors but were still less able than the good readers. Reducing the information processing demands by simplifying the semantic and syntactic content of the text reduced some of the problems for poor readers but not the underlying difficulty which appears to be the inability to monitor their reading as they decode. Other studies have tended to demonstrate the same pattern of results (e.g., Kavale and Schreiner, 1979; Garner and Kraus, 1982; Grabe and Mann, 1984)

### *2.3.3 Summary*

It would appear from the evidence outlined above, that self-monitoring behaviour is dependent on the age and competency of the reader. As readers mature, their ability to self-monitor and regulate their reading behaviour increases. However, such improvements seem to be related to skill as a reader rather than simply to age. Thus it might be hypothesised that an older, poorer reader experiences the same level of difficulty in self-monitoring as a chronologically young reader.

### *2.3.4 Asking Questions whilst reading:- a case of self-Interrogation*

Self-correction and the ability to detect inconsistencies in texts are two indicators of self-monitoring behaviour. In addition to these skills, the ability to generate questions about a passage and to answer such questions might also be regarded as evidence of self-monitoring. In such instances the asking and answering of questions acts as a self-assessment strategy, or as Brown, Armbruster and Baker (1986) label it: "self- interrogation". As was indicated in Chapter 1, to formulate questions about a passage the reader must know what type of question to ask and when such behaviour may be a useful strategy for improving understanding. In determining when to generate questions about a text, readers must keep track of their on-going understanding so as to detect failures in comprehension. Asking self-generated questions as a means

of monitoring one's understanding of text is an example of metacomprehension behaviour (viz. Flavell's, 1981) definition of metacognitive experiences), and has been found to be an effective strategy for improving comprehension. For example, Andre and Anderson (1978; 1979) found that when students were trained to generate questions about a passage whilst reading, and to find answers to their questions, their understanding of the passage increased. Singer (1978) deployed a similar strategy with high school students (aged 14 +) and found that those who generated questions about a text whilst reading were more effective at self-monitoring than those restricted to teacher-generated questions. The assumptions being made by both researchers was that, to generate questions, readers have to monitor and evaluate their on-going reading behaviour if they are to go on and answer their own questions. The act of asking questions in effect, forces readers into a self-monitoring mode. Self-question generation might, therefore, be regarded as a useful strategy for encouraging readers to monitor themselves when reading.

Whilst asking questions may help to regulate one's reading it does not necessarily improve one's overall interpretation, since this would depend on the quality of the questions generated (see Chapter 1 Section 1.8.4). Thus as Collins, Brown and Larkin (1980) noted, failures of comprehension may result from failure to ask the right questions. Or, as Miyake and Norman (1979) aptly state: *"To ask a question one must know enough to know what is not known"*

In a larger scale and better controlled study than those noted above, Baumann, Seifert-Kessell and Jones (1992) compared two instructional approaches to improving self-monitoring behaviour, one of which involved the generation of predictive type questions (e.g., Is the dog going to catch the ball?, "What will happen to the dog if it doesn't catch the ball?). The issue for Baumann et al. was which of their two instructional approaches for teaching self-monitoring was most effective? A pre-post test control group design was employed with three experimental groups:

I. a think-aloud (TA) intervention strategy group in which children were taught various comprehension monitoring strategies for reading stories (e.g., self-questioning, prediction, retelling, re-reading) through the medium of thinking aloud.

II. a directed reading-thinking activity (DRTA) group which involved the children in making predictions about the content and meaning of the text, and reading on to test out whether or not their predictions were correct (predict-verify strategy).

III. a directed reading activity (DRA) group which represented normal class-room practice and was not specifically designed to improve self-monitoring behaviour. This group acted as an instructional control group designed to control Hawthorne effects.

Four pre- and post-tests were administered to the children, a norm referenced cloze test (Degrees of Reading Power, 1986), a self produced error detection test which was lexically consistent but semantically inconsistent, a comprehension monitoring questionnaire and a structured interview. The comprehension monitoring questionnaire and the structured interview provided qualitative information about the strategies which the children deployed to monitor their reading comprehension. The questionnaire comprised 18 multiple choice questions which tapped various aspects of self-monitoring behaviour. For example:

*When I read it is a good idea to:*
*A: sound out words I don't know.*
*B: make some guesses about what will happen in the story.*
*C: make a list of all the details in the story.*
*D: look up new words in the dictionary.*
(Option B was regarded as indicative of comprehension monitoring behaviour).

The structured interview was given to 12 children, 4 from each experimental group, and selected by the researchers because of their verbal fluency. It was argued that children with good verbal fluency would be more able to perform in the interview. The interview explored the children's self-monitoring behaviour in more depth than that achieved

by the questionnaire using unseen passages and probe questions of the form: "Do you ever get mixed up or confused when you read?", "What do you do to help you understand better when you do get mixed up?".

68 mainstream children aged 10 years were randomly assigned to one of the three experimental conditions and were pre- and post-tested at the same time. The intervention programme lasted for 10 consecutive days with 10 lessons, each lasting approximately 45min. Baumann et al. found that those children in the TA and DRTA experimental conditions out performed the control group (DRA) on all four measures. There were no significant differences between the TA and DRTA conditions on the quantitative measures (cloze and error detection tests), but when the interview data were analysed they found that the TA children reported and demonstrated greater depth of understanding of comprehension monitoring strategies than either the DRTA or DRA groups.

In both the think-aloud (TA) and directed reading-thinking (DRTA) conditions, children were being encouraged to self-monitor. In the former condition the children made explicit through their verbalisations, the monitoring strategies they were deploying. In the DRTA condition, children developed self-monitoring skills through predictive self-questioning and verifying but were not expected to articulate these strategies publicly as in the think aloud strategy. However, in practice it is likely that by making the monitoring strategies explicit through the questioning and verifying strategy, children would deploy covert think-aloud strategies (i.e., they would be thinking silently). The two conditions may therefore have been more similar than originally anticipated in the design. It might be argued therefore, that each of the two strategies, TA and DRTA, encouraged children to self-monitor through the use of predictive strategies. What is interesting perhaps is the finding that, by making children externalise processes which are essentially covert through the use of think-aloud, their <u>reported</u> knowledge about monitoring strategies was greater than those children who did not make explicit their monitoring strategies (i.e., in the DRTA condition). However, the significant difference between the TA and DRTA group was only demonstrated by the structured interview measure and this should be

regarded with some caution given the difficulties already expressed in Chapter 1 about the use of verbal self-report data. Additionally, the children used to obtain the interview data were not randomly selected but were deliberately selected by the researchers. The lack of randomisation prevents the results from being generalised across the population, thereby preventing any firm conclusion from being drawn about the superior nature of the think aloud.as compared with the DRTA strategies.

The above study is however, important because:

I. it demonstrates that children can be taught to self-monitor with the effect of improving their comprehension. Such positive effects provides supportive evidence for those earlier studies which suggested that young and poor readers lacked self-monitoring abilities and would benefit from instruction in such strategies (e.g., Markman, 1977; 1979; Paris and Myers, 1981; Garner and Taylor, 1982).

II. it is one of the few studies to use an instructional control group indicating that extra reading practice, and/or teacher attention is not sufficient in itself to produce gains in self-monitoring behaviour

Similar positive effects of self-monitoring training for learning disabled students are reported in a study by Malone and Mastropieri (1992). 'Learning disabled' in the context of this study referred to children who were of average intelligence as measured by the WISC-R (Wechsler, 1971), but had delayed decoding and reading comprehension scores (i.e., 2sd below the mean on the Iowa Test of Basic Skills (Hieronymus, Lindquist and Hoover, 1981), and the Woodcock Reading Mastery Test (Woodcock, 1987)).

A pre-post design was deployed with three experimental conditions:

I. a self-monitoring and summarisation group

II. a summarisation only group

III. a traditional instruction group which acted as a control condition

The self-monitoring and summarisation condition involved the children in reading a passage and summarising the main ideas. The children were

given prompt cards with the words "who or what", "what happened" and "summary sentence", designed to cue them into the strategies which would be helpful in the task of summarisation. The children were encouraged to tick each of the phrases as they considered them, and in this way were encouraged to self- regulate their behaviour. The summarisation condition was the same as condition 1 without the prompt card. The traditional teaching group looked at and defined words within the passage. The training took place over three days, with the third day being used for post-testing. The pre- and post-tests involved the children in reading unseen passages pre- and post- intervention. Whilst reading, the children were required to think aloud the strategies they would use to provide summary statements of the main ideas in the passages. They were also required to write summary statements of the content. Independent judges marked both the think-aloud protocols and summaries. In the summaries the judges were looking for the number of main ideas identified and in the think aloud protocols, evidence of readers' use of the self-monitoring strategies taught during days 1 and 2 of the investigation. For example:

I. reminding themselves to look at the title to set the context for the story
II. thinking about their previous experience and relating this to the content of the passage they were currently reading
III. looking for key words within the text to help identify main ideas

Malone and Mastropieri (1992) found that those children in the summarisation and self-monitoring condition out performed those in the other two conditions. The combination of summarisation and self-monitoring training appeared to produce powerful effects for children with poor reading skills, at least in terms of improving their summarisation and self-monitoring behaviour. Unfortunately, there is no indication as to whether improvements in self-monitoring behaviour, as measured by the think-aloud protocols, helped to improve comprehension.

Additionally, the measures used to assess the effects of intervention were the same as those skills taught in the training sessions. It might be argued therefore, that the study simply reported what was taught in the

intervention. A more convincing demonstration of the effects of intervention would have been made had the dependent variables been unrelated to the content of the training. It is also worth noting that the duration of the intervention was surprisingly short (i.e., 2 days). If such significant results can be obtained over such a limited period then one wonders why the strategies taught by Malone and Mastropieri have not been used more widely.

Despite the methodological criticisms noted, Malone and Mastropieri's (1992) study indicates that focused instruction in self-monitoring strategies can have measurable effects on poor readers' self-monitoring behaviour.

### *2.3.5 Summary of self-monitoring studies*

The studies described underline the methodological and psychometric problems inherent in the investigation of self-monitoring behaviour and discussed in Chapter 1. Taking these difficulties into consideration, and focusing on those studies which used pre- and post- intervention designs with matched control groups, it is possible to draw some conclusions about children's self-monitoring abilities. Investigative studies such as those by Markman (1978) and Paris and Myers (1981) which concerned themselves with whether or not children were able to self-monitor, suggest that with increasing age and reading skills, children's ability to regulate their own reading behaviour increases. Such regulation is shown by older and better readers' ability to spot inconsistencies in text, to self-correct, and to generate questions about a text. Conversely, poor and young readers appear to have greater difficulty in performing these self-monitoring skills. However, it has been demonstrated by instructional studies designed to teach children those self-monitoring skills in which the children appear to be deficient, that young and poor readers can be trained to self-monitor (e.g., Brown, Armbruster and Baker, 1986; Baumann, Seifert-Kessell and Jones, 1992).

The interesting question not directly addressed is whether or not improvements in self-monitoring behaviour enhance children's comprehension. The implicit assumption being made by the above

research is that by making children more aware of their cognitions and cognitive processes their ability to comprehend will improve. Further more, it might be hypothesised from the evidence presented that such a question is of particular importance to both young and poor readers where it has been shown that both their metacomprehension knowledge and ability to self monitor are impaired when compared with old and good readers. For young readers, the question raised is one of acceleration. For poor readers the question raises the issue of remediation or compensation. The following sections will begin to consider the impact of metacomprehension training on children's comprehension thereby turning to the third focus of the review: the application of theory to practice.

## 2.4 Instructional programmes

There are many examples of instructional programmes designed to enhance comprehension. In their review of the literature, Pearson and Fielding (1991) refer to over 200 studies designed to improve various aspects of children's comprehension. There are studies designed to help children summarise (e.g., Day, 1986; Cunningham, 1982; Rinehart, Stahl and Erickson, 1986;), to enlist and activate prior background knowledge and experiences (e.g., Hansen, 1981; Hansen and Pearson, 1983; Silven, 1992), to find the main idea (Schunk and Rice, 1987), and to ask and answer self-generated questions (Hansen and Pearson, 1983; Raphael and Pearson, 1985), all of which have been shown to improve children's comprehension. What seems to be important and has made studies in the last decade different from those in the 70's, is the emphasis on students' proactive role, demonstrated by self-monitoring and an understanding of **when** and **why** to apply their learning. Pearson and Fielding (1991) note: *"a third warranted generalisation is that students understand what they read and learn how to understand what they read in the process of learning how to monitor their comprehension"* (p.847).

It is interesting to reflect that many of the instructional programmes to be discussed were never designed to teach children metacomprehension strategies, their principle objective was to improve a specific aspect of

comprehension such as the identification of main ideas, or the answering of inferential questions. However, in achieving these cognitive goals it is apparent within the training programmes that some metacomprehension training occurred. The following discussion focuses on two influential areas of investigation, those of identifying main ideas and the development of inferential skills, both of which have some relevance to future metacomprehension interventions. Having looked at studies which were essentially designed as comprehension programmes, the discussion will move onto the literature concerned specifically with metacomprehension training and its effects on comprehension.

### *2.4.1 Identifying main ideas and making inferences*

Pearson and Johnson (1978) assert that identifying main ideas in a text is the *"essence of reading comprehension"*. In attempting to find the main ideas, readers have to monitor their reading to keep track of what is being communicated, regularly review and summarise information, and make predictions and judgments on the basis of the information given, or implied in the text. In making inferences readers may bring to the reading task information and personal knowledge which helps their interpretation. Locating main ideas and making inferences are interrelated activities, involving the reader in the application of a number of complex cognitive and metacomprehension skills and strategies. It is surprising therefore, that there appears to be little time or emphasis given to these activities in the classroom.

Durkin (1981) reported from her observations of classroom instruction together with analysis of basal reading texts and manuals, that children may be directed to look for main ideas but are rarely taught **how** to do this. Similarly in an extensive study by Hare and Milligan (1984) looking at the teaching of main ideas in four standard basal reading schemes, it was found that *"explanations of main idea identification were characterised more by mentioning than true explanation"* (p.200). Facts about what a main idea might be were taught, but children were not shown ***how*** to identify a main idea and ***when*** and ***where*** to use the skills involved in the identification process. As Hare and Milligan indicate, effective instruction in the identification of main ideas should

detail *"what the skill is and why the skill is important (its purpose); when and/or where the skill applies; and how to execute the skill step by step, and evaluate the use of the skill'* (p.190). Essentially, Hare and Milligan are arguing for the introduction of metacomprehension training into the teaching of main idea identification. Facts or knowledge about what constitutes a main idea are not sufficient if the knowledge is not accompanied by procedures and skills designed to help find the main idea, and insight about when and where to apply the skills. Such information allows students to become independent learners, since they are able to reflect on and monitor their own progress, and to implement appropriate strategies to overcome failures in comprehension. This is implied by Hare and Milligan when they go on to state:
*"Such an explanation releases the teacher from the responsibility of regulating and overseeing students' use of the skill, and passes the responsibility to the students themselves"*. (p.190).

It may be argued that the omission of the procedural and conditional aspects of instruction in basal reading schemes is not as prevalent today as in the 1980's when Durkin (1981), Hare and Milligan (1984) were conducting their research. Certainly it is true that during the 1980's there was a shift in thinking in relation to comprehension instruction toward an emphasis on the need to teach children the declarative and procedural aspects of reading. This is demonstrated by Pearson and Gallagher's (1983) review of the literature, and in a later review by Silven (1991), both of which concluded that an **explicit** model of teaching children comprehension skills should be applied in classrooms. Such a model encourages teachers to show children how to carry out a procedure or skill, to provide opportunities for guided practice in the skill, followed by independent practice. Finally students are encouraged to apply the skills on their own. These three ingredients, demonstration, modelling, and independent practice appear to be important components in the teaching of comprehension skills. In combination they provide children with an awareness of their metacognitive knowledge in relation to reading, together with insight into their cognitive processes (i.e., metacomprehension strategies).
Despite the growing realisation that children need to be taught **how** to

comprehend, there is still little evidence of such knowledge being put into practice within basal reading schemes, or for that matter, general teaching practice (see Roehler and Duffy, 1984, and Chall and Squire, 1991). Such criticisms are still valid, being remarked upon in current reviews of the literature. For example, Clark (1996), commenting upon the American classroom, asserts that whilst the knowledge about how best to teach children comprehension skills exists within the research literature, little has filtered into classroom practice "*at any noticeable pace*".

The author would assert from anecdotal evidence that the situation in Britain is little different. For example, when teachers are asked **how** they teach children to comprehend, their responses tend to be rather vague, and relate to assessment rather than teaching objectives (e.g., "I ask them questions" (to see if they understand), "We talk about the story"). In addition, worksheets from mainstream reading schemes usually consist of lists of questions which require children to find the main idea and make inferences, the assumption being, that the children have already acquired the necessary strategies to perform such tasks successfully. Assumptions such as these seem unwarranted given the contrary research evidence. For example, in a review of the literature Baumann (1982a) found that children, even up to the age of 12 years, had difficulties in recognising, recalling or constructing the gist, central theme, or main idea from prose passages. Similarly, it is reported by Brown, Armbruster and Maker (1986) that although children as young as six can indicate the main character and sequence of events in a well structured story (viz. Stein and Glenn, 1979), they often have difficulty in isolating central issues in more complex prose. The implication is, that if young children are to acquire these skills and if it is believed that they are important for comprehension, then they need to be taught within instructional programmes, since it can not be assumed that children have already acquired such comprehension strategies (vis. a vis. Hare and Milligan, 1984; Clark, 1996).

### *2.4.2 Can the identification of main ideas be taught?*

It was indicated in the previous discussion that certain key elements

appear to be necessary in instructional programmes to promote independent comprehension of narrative texts. These were outlined as:

- instruction in how to perform a comprehension strategy
- guided practice in the application of the strategy
- practice in applying the strategy independently

In combination, it was suggested, that this instructional approach encourages children to be aware of their cognitive knowledge and processes in relation to reading comprehension, that is, to demonstrate metacomprehension behaviour,

It will become apparent from the studies to be reviewed that each of these key elements are incorporated within the teaching programmes discussed, providing increasing evidence for the validity of metacomprehension training in the teaching of comprehension skills.

#### *2.4.2.1. The teaching of main ideas*

Baumann (1984) provides a good example of the positive effects of a main idea instructional programme which incorporates all of the instructional features described above. It is a well controlled study allowing comparisons to be made between the experimental treatment-that of main idea instruction, with two control conditions, one where children received main idea worksheets but no training, and a 'placebo' condition where children were given an unrelated task of learning vocabulary items. The 'placebo' condition is a unique design feature of Baumann's study and helps to counter those criticisms which could be made of earlier research, namely, that increased teacher attention could be the critical factor in increasing children's comprehension rather than the content of the teaching programme (e.g., Day, 1986). With the placebo group, the children in all conditions would have received the same amount of attention, thereby controlling for this variable.

Baumann (1984) instructed children aged 11 to 12 years in how to find main ideas from text. The programme was based on an earlier study by Day (1980) concerned with teaching children summarising skills. The pupils were given information about what a main idea was and how the strategies they were to be taught would help them to find main ideas

(declarative information). They were then provided with direct instruction as to how to go about generating and finding main ideas (procedural information). The teacher then demonstrated the strategy (guided practice) and the children were finally given the opportunity to apply it themselves (independent application of strategy training). Their performance was compared with the children in the control condition who were given main idea worksheets but no strategy training, and the 'placebo' children who were given an unrelated task of learning vocabulary items. It was found that children given strategy instruction were more able to identify both explicit and implicit main ideas in unseen passages than those children in the control groups.

Baumann's (1984) study provides evidence that children can be taught to identify main ideas if they are given explicit instruction in how to locate important information. However, what is perhaps more important about Baumann's study is the nature of the training activities. Children were given declarative knowledge about the strategy, and procedural instruction in how to perform the strategy, this was then followed by guided and then independent practice of the strategy. Essentially, the children were provided with metacomprehension knowledge and experiences. Metacomprehension experiences were provided through the use of guided practice which allowed the teacher to model for the children her own cognitive processes involved in locating main ideas.

Similar findings to those obtained by Baumann (1984) are reported by Schunk and Rice (1987) who were concerned with teaching poor readers main ideas. They were interested in teaching children not only procedures related to the identification of main ideas, but also **why** it was important to learn such strategies. In providing children with explanations as to why specific strategies were important, they were attempting to make children more aware of what metacomprehension knowledge they had (i.e., awareness of knowledge) and when it could most productively be used (i.e., awareness of their cognitive processes).

In their instructional programme Schunk and Rice (1987) provided poor readers, defined as those children scoring below average

comprehension scores on a standardised reading test with differing amounts of information about the usefulness of the strategies being taught to identify main ideas (i.e., conditional knowledge). There were three training conditions; general strategy value information (this strategy will help you answer questions), specific strategy value information (this strategy will help you identify main ideas) and a combination of specific and general. They found that those readers given the combination were more proficient in identifying main ideas, than those only given the specific or general information. It would appear that the more conditional information provided (i.e.,"this strategy will help you answer questions" **and** "....identify main ideas"), the greater the benefits of instruction. It may be that the combination instruction helps children to generalise their learning beyond the specific to the general. Thus, by telling children what different strategies are capable of achieving they may be more able to gain insight into how such strategies might be transferred across situations. In effect, the combination instruction is telling children that they have different strategies at their disposal and these can be used to aid comprehension. In contrast the specific information simply informs children about one particular comprehension strategy for a specific function (e.g., to find main ideas).

### *2.4.3 Inferential training*

As indicated previously, inference training is related to the identification of **implicit** main ideas. To identify a main idea which is embedded, rather than explicitly stated within a text, the reader has to apply inferential strategies such as looking for word clues, using prior background knowledge and experiences, and finding key information which may require integration across sentences or paragraphs. Instructional training of main idea identification and of inference making is mutually supportive when the main idea is implicit within the text. Unfortunately, studies of main idea and inference teaching seem to have been mutually exclusive, the overlap between the areas having been ignored or possibly only implied.

It is generally accepted that children have more difficulty in answering inferential, than literal questions about a text (e.g., Pearson and Johnson,

1978; Pearson, Hansen and Gordon, 1979), yet the use of inference in everyday life is quite common, even in very young children (Donaldson, 1978). It has been hypothesised by Hansen (1981) and Hansen and Pearson (1983), that the difference between children's ability to cope with inference in everyday contexts, and their inability to do so in classroom reading situations, may be a reflection of the instructional emphasis common to basal reading schemes. They argue that children are taught to read to remember, rather than to think and infer. Certainly the evidence presented previously in relation to the type of instruction observed in classrooms, and present in teachers' manuals, suggests that children are not taught how to comprehend, and that there is a greater emphasis on literal rather than inferential question forms. Hansen and Pearson (1983) note that 80% of questions in basal reading schemes are literal and 20% inferential. The difference between children's ability in the two situations described may also reflect the rather abstract nature of reading, and children's differing perceptions of the skills required to read compared with those required in everyday conversation. Young children view reading as a decoding exercise (Clay, 1978), which may inhibit their use of the kind of inferential thinking skills which they deploy in their day to day conversations. Given the difficulties which children appear to have in making inferences when reading, Hansen (1981) and Hansen and Pearson (1983) were interested to see if children could be taught to make inferences. These studies are important since they underpin many of the future studies to be discussed on metacomprehension training (e.g., Paris, Cross and Lipson, 1984; Paris and Oka, 1986).

### *2.4.4 Training of inferential skills*

Hansen (1981) taught a group of children (mean age 7.5 years) to make inferences using an "inferential thinking strategy". The children were encouraged to be aware of the importance of making inferences and to activate and use prior background knowledge. Pre-reading instruction was a critical feature of the training. A typical example of the teaching strategy is provided by Hansen and Pearson (1983):

*Teacher (T): What is it that we have been doing before we discuss each*

*story?* (declarative knowledge)[2]
*Children (C): We talk about our lives and we predict what will happen in the stories* (pre-reading strategy)
*T: Why do we make these comparisons?* (conditional knowledge)
*C: These comparisons will help us understand the stories*
*T: .....Today pretend that you are reading a science article about conservation. What might you be thinking about whilst you are reading?* (self interrogation/monitoring)

In the above example the children are encouraged to link their knowledge and experience to the information in the text, and then to make predictions and ask internal questions of themselves about what might be in the text, and what they might want to find out. They are in effect creating a personalised reading agenda prior to reading which involves the use of cognitive and metacomprehension strategies. In the extract above the teacher is encouraging her pupils to think at declarative and conditional levels; she asks the declarative question ***"What is it that we have been doing....."*** and then follows it with a conditional question: ***"Why** do we make comparisons."* The children are then encouraged to think about their thinking, exemplified by the question: *"What might you be **thinking about** whilst you are reading"?* Interestingly, their attention is drawn to their own internal thinking processes in a predictive way (i.e., before they start to read). This is different from the kind of self-monitoring identified by, for instance Brown, Armbruster and Baker (1986) which takes place as the person is involved in the task of reading, but is similar to the predictive condition described by Baumann, Seifert-Kessell and Jones (1992), in their comprehension monitoring study.

From the above introduction it can be seen that whilst Hansen (1981), and Hansen and Pearson (1983) were not explicitly following a metacomprehension agenda, their teaching strategies placed a heavy emphasis on metacomprehension strategies.

As noted previously, 'inferential thinking strategy training' was given to one group of children whilst the other experimental group was given

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2 author's parentheses

practice in answering inferential questions (with no training in how to answer them). The children were given pre- and post- tests of comprehension. The test comprised 3 literal and 3 inferential questions. Literal questions could be answered verbatim from the words in the texts, while inferential questions required some 'world knowledge'. Hansen found that both groups performed better, on both literal and inferential questions, than a control group who continued to use their reading scheme. The results from Hansen's first study are a little concerning given the discussion to date, since they imply that practice in answering inference questions has the same effect as using a specific metacomprehension instructional approach. However, the study gives no indication of the effect of combining the two experimental conditions. This is an important consideration since it has already been seen that combining training methods can provide a more powerful effect, suggesting that practice in applying the metacomprehension strategies to the specific comprehension task, in this case answering inferential questions, produces more improvement in task performance (e.g., Schunk and Rice, 1987).

It is possible that Hansen's (1981) findings resulted from an over emphasis on conditional training and too little practice in using the metacomprehension strategies to answer inferential questions. A better balance of strategy and skill training may have produced differential effects between the conditions. This issue, together with a number of other factors was investigated in a later study by Hansen and Pearson (1983), which provided some support for the theory, that combining instructional practice so that it provides declarative, procedural and conditional training produces greater improvements in comprehension.

Hansen and Pearson (1983) repeated the investigation by Hansen (1981) with a number of important changes:

1. teachers delivered the training
2. inferential and metacomprehension strategy training were combined
3. good and poor readers were used instead of average readers as in the original study. Good and poor readers scored respectively 3

years above and below their chronological age on the Stanford Achievement Test. Unfortunately they provide no details of, or reference to the comprehension sub-test, making it difficult to comment further on the precise nature of their good and poor readers.

An experimental/control, pre- and post- intervention design was used. Children aged 9 to 10 years were randomly assigned to the experimental group. They were trained by their class teacher to use the inferential thinking strategy previously described and were also given practice in answering inferential questions, thereby combining the treatments from the two experimental groups in the first study. Training took place over 10 consecutive weeks using 2 lessons per week, each lasting 20 to 25 minutes. The control groups received their normal basal reading scheme which consisted of discussion exercises lasting 10 to 20 minutes together with worksheet activities comprising both literal and inferential questions (in the ratio 4:1). It is not clear from the description provided by Hansen and Pearson whether the total time spent on reading comprehension activities was the same for both the experimental and control groups although this is inferred from their discussion.

The same dependent measure as that used by Hansen (1981) was used to measure changes in performance (i.e., a comprehension test of 3 literal and inferential questions). They found that the intervention produced significant results for poor readers ($p < .01$) but not good readers ($p > .05$) when answering inferential questions. Thus, the experimental poor readers answered significantly more inferential questions post- intervention, but this was not the case for good readers. It was suggested by Hansen and Pearson that the reason the good readers did not improve their inferential comprehension skills was because the reading material did not stretch them sufficiently since they were given passages to match their chronological age (CA), rather than their reading age which was on average 3 years above that of their CA. The strategies being taught may not, therefore, have been viewed as useful or relevant by the good readers.

Hansen and Pearson's finding has important implications for training since it suggests that material used for training purposes should be sufficiently challenging to encourage the need for metacomprehension strategies. A similar criticism could be made of Hansen's (1981) original study using average readers, explaining perhaps the lack of difference between the practice only group and the 'inferential thinking strategy' group.

Hansen and Pearson's (1983) investigation suggests that combining training methods so that they include both practice in the cognitive goal being sought, in this case the answering of inferential questions, together with training in metacomprehension strategies, produces a greater improvement in poor readers ability to answer inferential questions. Such effects were obtainable by teachers in normal classroom situations. Unfortunately, it is not clear from Hansen and Pearson's results whether similar training using more challenging texts would be equally effective for good readers. However, it will be seen later that good readers can also benefit from metacomprehension training (e.g., Paris and Jacobs, 1984; Paris, Cross and Lipson, 1984)

The differential effects of metacomprehension training on good and poor readers' inferential comprehension are also demonstrated by young and old readers. Like the findings reported in relation to children's metacomprehension knowledge and self-monitoring skills (e.g., Myers and Paris, 1978; Canney and Winograd, 1980; Paris and Myers, 1981), training studies in inferential question answering reflect a similar pattern of results. For example, Raphael and McKinney (1983) and Raphael and Pearson (1985) report differential effects of inferential training for old and young readers. They taught two groups of secondary aged children (mean age of younger group: 11.6 years; mean age of older group: 13.6 years), the relationship between questions and answers, and how such information could be used to find relevant information in text. The training took place over 4 weeks (four sessions of 40 minutes duration each week) with a maintenance practice period of eight weekly lessons. In the first study the researchers implemented the training programme, and in the second, classroom teachers taught their own classes. The

children were given post- reading questions and shown where to locate the information to answer the questions. In this way they were instructed about the relationship between questions and answers: for example, the children may have been told that some questions have answers which are in the text, while others depend on using previous knowledge. These studies found that training improved the younger (mean age 11.6 years), but not the older (mean age 13.6 years), pupils' inferential skills, and such results were obtained from both researcher and teacher implemented programmes.

It appears that training in question asking and answering can improve children's inferential skills, particularly those children who are not good at this type of activity or who are young readers.

### *2.4.5 Summary*

The above review has looked at instructional approaches to teaching children how, and what to do to become better comprehenders of text. Implicit within many of the approaches has been the teaching of metacomprehension strategies, particularly at the declarative and procedural levels. What is clearly missing from all of those studies described is the explicit instruction of self-monitoring and regulation of comprehension. This is particularly noticeable in Raphael and McKinney's (1983) and Raphael and Pearson's (1985) studies which attempted to merge the instructional strategies used for identifying main ideas and for inferring information. The generation of questions was not taught as a means of self-monitoring or of self-interrogation, but rather used as a demonstration of the relationships between questions and answers. The underlying rationale for teaching children this relationship was presumably that they could then use this knowledge to assist in their independent reading and answering of similar questions. However, it might be argued that without having this as an explicit aim, children may not be able to generalise the learning to other contexts. This point is made by Gavelek and Raphael (1985) who suggest that studies which concentrate on teaching children *what* and *how* to answer questions (such as in Raphael and McKinney, 1983) entail minimal metacomprehension activity. Encouraging pupils to generate their own

questions, and subsequently to seek answers to their questions, involves more extensive metacomprehension activity. Gavelek and Raphael's argument is based on the view that question asking and answering can be viewed as a continuum of student independence and dependence. In being taught how to answer others' questions, students are still reliant on the guidance of their teacher; it is only when students begin to formulate their own questions, allowing independent and meaningful interaction with the text, that they become truly independent reflexive learners. It may be argued that teaching children what and how to answer questions is a cognitive process, and that it is only when such skills are used independently to self-monitor (such as asking one's self questions to monitor understanding) that one can be said to be behaving metacognitively. This point relates to Flavell's (1976) distinction between cognition and metacognition where it will be remembered that he noted:

*"Asking yourself questions about the chapter might function either to improve your knowledge (a cognitive function) or to monitor it (a metacognitive function)".*

It may be that Raphael and McKinney (1983) and Raphael and Pearson (1985) did encourage children to use question generation as a monitoring activity but this is not made explicit in their description of the training. Transcripts of the interactions between pupils and teacher would have been helpful in identifying the nature of the instruction, however this is not provided. The present author would argue that to ensure improvements in comprehension and to enable the generalisation of such learning, it is advisable to teach children declarative, procedural and conditional knowledge, in other words, metacognitive knowledge and experiences (vis. a vis. Flavell, 1976). It will be seen later that those studies which specifically refer to metacomprehension in the teaching of reading, make explicit the elements described above (Paris and Jacobs, 1984; Paris, Cross and Lipson, 1984; Paris and Oka, 1986; Paris, Saarino and Cross, 1986).

The following discussion will now concentrate on empirical investigations which claim to have grown out of a metacognitive research tradition, and

whose aims are to encourage children to 'learn how to learn from reading' (Brown, 1978; Puntambekar, 1995).

## 2.5 Instructional Approaches to Developing Metacomprehension Strategies.

In their paper entitled, "*Learning to Learn: On training students to learn from texts*", Brown, Campione and Day (1981) argue that instructional programmes should not only be concerned with improving performance per se but should also concern themselves with improving *"student's self-control and self-awareness of their own learning processes"*. It is such insight which they feel helps to make students proactive and self-sufficient learners. They conclude that:

*"If learners can be made aware of: 1) basic strategies for reading and remembering, (2) simple rules of text construction, (3) differing demands of a variety of texts to which their information may be put, and (4) the importance of activating any background knowledge which they may have, they cannot help but become more effective learners. Such self-awareness is a prerequisite for self regulation, and the ability to orchestrate, monitor and check one's own cognitive activity"* (p. 20).

Learners and educators have to be aware of what influences learning before they can use such information to effect better learning. Thus, in developing instructional programmes it would seem to be important to ensure that learners are not only instructed about specific strategies but are also told *"explicitly how to employ, monitor, check and evaluate the strategy"* (Brown, Campione and Day, 1981); in other words, to behave demonstrate metacomprehension behaviour.

Metacomprehension teaching programmes differ from other more traditional cognitive programmes by incorporating a self-monitoring and regulatory aspect, making readers more aware of their own cognitive processes whilst reading. An additional prerequisite would seem to be the explicitness of the training, particularly for poor and younger readers who appear not to acquire metacomprehension knowledge and self-monitoring strategies from their normal classroom experiences (viz. Myers and Paris, 1978; Bereiter and Bird, 1985; Garner, 1990; Gambrell

and Palmer, 1992). Young and poor readers would seem to need explicit training about **why** they are being taught a skill and **when** it is appropriate to use the skill.

### *2.5.1 The need for overt, explicit training of metacomprehension skills.*

Explicit instructions can take many forms. It is important to be clear about which aspects of the instruction should be made overt to the learner. It has already been noted that metacomprehension programmes have three levels of knowledge: declarative, procedural and conditional. Should each of these aspects be taught explicitly?

Brown, Campione and Day (1981) go some way towards clarifying the above question. In their review of the metacognitive literature related to recall, they found that three main forms of training could be discerned; blind training, informed training and strategy plus self-control training. Of the three, self control training was the most effective, possibly because it involved the explicit teaching of declarative, procedural, and conditional knowledge, together with explicit instruction in self-monitoring.

Blind training involves modelling a strategy for a student without explicitly explaining why the strategy may be useful. Not surprisingly, such training does not transfer to other situations principally because the learners have not been taught the significance of the strategy. They have in effect been given a skill rather than a strategy.

In informed training, learners are taught the skill and provided with information about its significance. They may also be given practice in using the skill in other learning contexts. Such instructional programmes appear to be well maintained, and generalise, but only across very similar tasks to that of the original training (Brown and Campione, 1978; Clark, 1996).

Brown, Campione and Barclay (1979) demonstrated that when self-control training was used, results were maintained and generalised across tasks. They trained slow learners to use a self-checking strategy designed to help them establish whether or not they had learned and

could recall sufficient information to be tested on it. They encouraged the children to test themselves and to monitor their state of learning. They found that by i) simplifying the task to a set of basic rules, ii) training an appropriate learning strategy, and iii) training the self-monitoring of that strategy, children were able to maintain and generalise their learning. The younger and more 'disabled'[3] the reader, the more explicit the training required to be.

Similar results have been obtained more recently by researchers investigating:

I. the teaching of single comprehension strategies such as the identification of main ideas (Graves, 1986), or the development of summarisation skills (Jenkins, Heliotis, Stein and Haynes, 1987), and
II. the teaching of multiple comprehension strategies such as the identification of main ideas, inference training, summarisation and the use of prior knowledge (Bruce and Chan, 1991)

Being explicit about why certain skills are being taught and when they can be used seems to be an important aspect of metacomprehension training. To ensure that such training generalises across learning situations it also seems to be important to encourage children to be self-regulatory. The impact of self-regulation and specific comprehension training such as summarisation has already been exemplified by the instructional studies discussed in Section 2.3.4 (Baumann, Seifert-Kessell and Jones, 1992; Malone and Mastropieri, 1992). The reciprocal teaching research, to be discussed more fully in section 2.5.2, provides further evidence of the need for explicitness of training. More specifically reciprocal teaching highlights the importance of making children explicitly aware of *why* they are being taught certain comprehension strategies, and *how* these might be used in future reading conditions.

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3 The term 'disabled' refers to children who have delayed reading attainments

### *2.5.2 The effect of Metacomprehension training on the development of reading comprehension*

Palincsar (1982) and Palincsar and Brown's (1984) studies on "reciprocal teaching" are frequently referred to in the literature as examples of metacognitive training and as such are included in the present review. More importantly, the reciprocal teaching method will be used as one instructional strategy within the intervention programme to be used by teachers in the present research (see Chapter 5) and is therefore, included for consideration.

Reciprocal teaching involves direct explanations and opportunities for children to model the teacher's behaviour through turn-taking. The teacher allows children to assume the role of teacher, and through feedback, prompting, and shaping of the children's behaviour, it is hoped that they will begin to mirror more accurately the teacher's model. In effect, reciprocal teaching allows the teacher to make her internal comprehension processes overt, thereby providing the children with an awareness of others' covert comprehension strategies. Being aware of others' comprehension processes allows the children to integrate such thinking into their own reading comprehension behaviour. The method draws heavily on Vygotskian theory, the teacher acting as expert tutor, guiding children towards their 'zone of proximal development' (see Vygotsky, 1978, and Chapter 3, Section 3.6 for a fuller discussion). The internalisation of the teacher's model is the ultimate goal of reciprocal teaching, since then the children will be able to independently apply the comprehension strategies being taught.

The reciprocal teaching method is used to teach 4 comprehension strategies:

1. question generating
2. summarising (review)
3. predicting
4. clarifying

Children are encouraged to generate questions about the main ideas in a passage (question generating), to summarise the text in the form "This

paragraph was about.....", thereby extracting and integrating the gist of the material read (summarising), to make predictions about what might happen next in the story and to base their predictions on both the information in the text and their own knowledge about the topic (predicting) and finally, to look for potential problems such as difficult vocabulary, or poor style of expression since these would signal possible blocks to comprehension (clarifying).

An example of a typical teaching session is provided by Palincsar and Brown (1984) and reproduced below. The extract follows on from a previous lesson, involving a lengthy dialogue led by the teacher and used to model the strategies of questioning, prediction, summarisation, and clarification.

.....

*Teacher: Could you select the next teacher?*

*(Student selects another student and begins reciprocal teaching)*

*Student A: Name two words that often describe mining salt in the old days.*

*Student 2: Back to the mines?*

*S 1: No. Angela?*

*Angela: Dangerous and difficult.*

*S 1: Correct. This paragraph is all about comparing the old mining of salt and todays mining of salt. (clarification)*

*T: Beautiful!*

*Angela: I have a prediction to make.*

*T: Good*

*Angela: I think it might tell when salt was first discovered, well it might tell what salt is made of and how it is made.*

*T: OK. Can we have another teacher?*

While involved in the reciprocal teaching dialogues, children are made more aware of their metacomprehension knowledge (i.e., knowledge of the 4 strategies) and are provided with the opportunity to select and organise this knowledge to effect better understanding. In selecting the

most appropriate strategies it is inferred that the children must also be involved in regulating and monitoring their ongoing understanding of text. Essentially, children are being taught metacomprehension strategies when the reciprocal teaching method is used in conjunction with the teaching of comprehension skills. They are supplied with metacomprehension knowledge at declarative and procedural levels together with metacomprehension experiences.

Before looking generally at the effects of reciprocal teaching on reading comprehension it is useful to look at Palincsar and Brown's (1984) investigation since it provides a typical example of the research methods used in the area and has been replicated in the majority of subsequent studies (see Rosenshine and Meister, 1994).

Twenty-one children with identified comprehension problems (as measured by a number of norm- referenced reading comprehension tests, and by their poor ability to answer comprehension questions designed by the researchers), participated in the study. A multiple baseline design was used and the results from the experimental group were compared some months later with a matched control group, which received the normal mainstream language curriculum. This is not an ideal control condition since some of the training given to teachers during the experimental phase could have been used subsequently to the benefit of other students who were later to become members of the control group. However, it does provide a comparison group which were matched according to their pre-test scores.

To measure the impact of the intervention programme the children were asked to read short passages of 200 to 400 words, taken from basal reading schemes and were required to answer comprehension questions derived from the passages. In addition, the children were asked to provide summaries of unseen passages which were scored by independent judges for the number of identified main ideas.

It was found that over a 20 day intervention period with daily lessons lasting for 25 to 30 minutes, the pupils` ability to provide written answers

to the comprehension questions significantly improved, and that this skill generalised to other similar language based activities within the classroom, and was maintained 5 days after intervention. Furthermore, reassessment 8 weeks later indicated that the gains were sustained but were not as great as those obtained during the 5 day maintenance period. When compared with the control group it was found that the children who received the intervention were more able to formulate questions, to summarise, and to become involved in informal dialogue about the text, all of which were skills taught during the instructional phase.

It would appear that when reciprocal teaching is used to teach the 4 comprehension strategies outlined, children's ability to answer comprehension questions and to provide summary statements of the main ideas in a passage improves. Replications by other investigators of Palincsar and Brown's (1984) use of reciprocal teaching suggests the following:

I. reciprocal teaching as a means of improving children's comprehension has positive effects for average (Brady, 1990) and poor readers' comprehension skills (e.g., Palincsar and Brown, 1984; Palincsar, 1987; Bruce and Chan, 1991). Poor readers are defined by their below average comprehension and occasionally, decoding abilities.
II. the method is effective with researcher implemented programmes (e.g., Palincsar and Brown, 1984; Lysynchuk et al., 1990) and when teachers administer the instructional programme (e.g., Palincsar, 1987; Taylor and Frye, 1992)
III. increased comprehension abilities appear to be maintained over time and across learning contexts (i.e., with fiction and non-fiction reading material (Palincsar and Brown, 1984; Lysynchuk et al., 1990; Bruce and Chan, 1991).

It is unclear from the descriptions of the reciprocal teaching programmes noted above which aspect of instruction was essential in achieving increased comprehension abilities. Thus, was it the teaching method (i.e., the use of reciprocal teaching dialogues), the comprehension

fostering activities (i.e., question generating, summarising, predicting, and clarifying), or the combination of teaching method and comprehension activities, which produced the comprehension gains?

These questions are partly answered by Rosenshine and Meister (1994) who compared the results of 16 controlled reciprocal teaching studies, 12 of which used the same 4 comprehension fostering activities as that deployed by Palincsar and Brown (1984), and four which used 2, 3, or 10 comprehension strategies. In all of the studies, summarising and question generating were included. No significant differences in children's comprehension were found between those studies using 4, as compared with 2, 3, or 10 strategies. Such evidence suggests that the reciprocal teaching method was the significant factor in determining the success of the instructional problems.

If, as suggested, the reciprocal teaching was the significant factor in Palincsar and Brown's study together with those replications noted above, then it would be useful to have some indication of which aspects of the reciprocal teaching dialogues were most effective. Unfortunately, the records of teacher-child and child-child interactions during the reciprocal teaching programmes are not consistent between studies and it is therefore, difficult to tease apart those aspects of the dialogues which were important. One way of controlling for this variable would be to provide teachers with a script, instructing them as to when to include children in the reciprocal teaching dialogue and what questions to ask. In the present study, a prescriptive instructional programme was provided for use by all teachers, thereby helping to limit the variation between teachers when using the reciprocal teaching method.

As was also noted in Chapter 1, the studies reviewed above show that self-produced comprehension tests were more likely to produce significant results than standardised, norm-referenced tests. However, it is worth noting that Palincsar and Brown (1984) did not define the question type used in their comprehension measure. It is therefore, difficult to assess whether or not there were differential effects for literal and inferential question answering, as would be predicted from the work

by Hansen and Pearson (1983). Given the above criticism, it would seem sensible when devising a comprehension test measure to ensure that both literal and inferential questions are included. As indicated in Chapter 1 it would be predicted that greater gains in inferential question answering would be obtained as a result of metacomprehension training because of the greater complexity of such questions and the need for greater strategic awareness.

#### *2.5.2.3 Conclusions*

It would appear that children's comprehension can be improved through the use of reciprocal teaching in combination with comprehension fostering activities such as those used by Palincsar and Brown (1984). If one accepts, as presented, that the combination of reciprocal teaching and comprehension strategy training provide a metacomprehension approach to teaching reading comprehension, then one might conclude that this form of instruction in metacomprehension can improve children's ability to understand. This conclusion applies to the understanding of both fiction and non-fiction, by both poor and average readers. None of the studies reported looked at good readers and therefore, no conclusions about the effects of reciprocal teaching on this group of readers can be made.

### *2.5.3 Informed Strategies for Learning*

The method of reciprocal teaching appears to have something to offer instructional programmes, but what happens when a combination of teaching methods and comprehension strategies are used to teach children how to comprehend? The following will outline the studies conducted by Paris and his colleagues (e.g., Paris and Jacobs, 1984; Paris, Cross and Lipson,1984), providing examples of multiple strategy approaches to teaching comprehension. Their research has been instrumental in promoting the importance of, and relationship between, metacomprehension awareness and improved reading comprehension. The research has been extensive, involving over 2000 students during a five year period. The early studies involved teaching an embryonic form of a metacomprehension programme entitled, Informed Strategies for Learning (ISL), (Paris and Jacobs, 1984; Paris, Cross and Lipson,1984).

The results of these early studies encouraged further refinement and elaboration of the programme for implementation by 50 volunteer teachers with their own classes (Paris and Oka, 1986; Paris, Saarino and Cross, 1986). The important point to be made in relation to Paris' work is that it grew out of a metacomprehension research background and might be expected to be a more focused example of the ideas expressed throughout the present paper.

Before proceeding to describe the results of the key studies undertaken by Paris et al., it will be helpful to provide an outline of the instructional programme, Informed Strategies for Learning

#### *2.5.3.1 Informed Strategies for Learning (ISL)*

Informed Strategies for Learning is a comprehensive curriculum designed to *"stimulate greater awareness of declarative, procedural, and conditional knowledge while also teaching children how to evaluate, plan, and regulate their own comprehension in strategic ways"* (Paris,Cross and Lipson, 1984, p. 1241).

In this context *'evaluation'* refers to an appraisal of the task, and one's own cognitive abilities. *'Planning'* involves the implementation of appropriate skills to address a problem, and *'regulation'* refers to the self-monitoring and redirection which goes on internally whilst involved in a task. The programme was based on three fundamental principles of effective teaching:

1. students need to understand the skills they are expected to learn,
2. students need the opportunity to share their thoughts and feelings about what they are learning, and
3. students need to be guided and coached to better and more independent levels of performance (Paris, 1986).

The programme currently consists of 20 modules designed for Grades 3, 4, and 5 (i.e., P4 to P6). Each module follows a similar format with approximately 20 typed pages of material consisting of stories and worksheets. In the 1984 studies 14 modules were used which were extended to 20 in the 1986 studies, unfortunately details of the

modifications to the programme are not reported by Paris or his colleagues. The modules covered different aspects of metacomprehension, each one building on the knowledge and experience gained from the previous ones. The 20 modules were divided into four groups:

**1 - 5 Planning for reading.** Lessons covered topics such as the goals and purposes of reading, and forming plans for reading (e.g., thinking about the purposes of reading and how to keep track of one's 'reading trip')

**6 -10 Identifying meaning.** Lessons included teaching children how to "detect hidden meanings" and to "track down the main idea".

**11 - 15 Reasoning while reading.** Lessons in this module encouraged children to make inferences and to preview and review the goals of reading.

**16 - 20 Monitoring comprehension.** Lessons in this module encouraged the self-regulatory behaviour common to metacomprehension and described by Brown, Campione and Day (1981). Children were therefore encouraged to self-correct, summarise and detect comprehension failures.

From the above description of ISL it is possible to see the influence of metacomprehension research. In particular there is an emphasis on teaching teachers to explain to children **when** and **why** they should deploy certain comprehension skills.

### *2.5.3.2 The effects of teaching children metacomprehension strategies using ISL.*

As indicated previously, Paris and his colleagues were concerned with the relationship between children's metacomprehension awareness and performance in reading comprehension. The question posed was therefore, if children are more aware of their reading behaviour and the importance of self-monitoring, together with the conditional aspects of specific reading comprehension skills, does their understanding of print improve? One way of approaching such an issue is to train children to become more metacognitively aware and to measure whether their reading comprehension improves as a result. Such an approach

assumes that children lack metacomprehension awareness; this seems to be a reasonable assumption given previous research, particularly that relating to young and poor readers (e.g., Myers and Paris, 1978; Paris and Myers, 1981).

Based on the above premise, Paris, Cross and Lipson (1984), and Paris and Jacobs (1984) conducted the following research programme to look at the effects of metacomprehension training. Experimental and control groups of children with a mean age of 8yrs 5mths and 10yrs 5mths were drawn from different schools. Two age groups were chosen in order to assess whether there were any age differences in the effects of training. In the Paris, Cross and Lipson study, three comprehension measures were used pre- and post- intervention, namely, the Gates MacGinitie (MacGinitie, 1978) and the Test of Reading Comprehension (TORC; Brown, Hammill, and Wiederholt, 1978), a cloze test devised by the researchers, and an error detection test). In addition, a multiple choice test was given post- intervention to assess children's strategic knowledge of the strategies taught during ISL. In the Paris and Jacobs study, the same comprehension measures were used (excluding the TORC), together with a metacomprehension interview designed to assess the pupils' metacomprehension awareness of comprehension strategies. The intervention programme was the same for both studies (i.e., ISL) and was introduced to the experimental group over a 14 week period: two lessons per week of approximately 20 minutes each were taught by one of the researchers. Both studies demonstrated significant effects of metacomprehension training on children's **awareness** of reading strategies, as measured by the multiple choice test and structured interview. Awareness of reading strategies also produced significant improvements in comprehension, as measured by the cloze test and error detection measures. No significant differences were found in scores on the comprehension tests, however. As indicated in Chapter 1, it was argued by Paris, Cross and Lipson (1984) that this may have reflected the inappropriateness of standardised reading tests for measuring metacomprehension abilities, rather than a lack of comprehension improvement. Given the significant results obtained from the reciprocal teaching studies using self-produced comprehension tests,

such a conclusion may be justified, and reinforces the methodological problems inherent in measuring the effects of metacomprehension programmes.

Children of both ages benefited significantly from the intervention as compared with a control group of children; however the level of significance was greater for the older age group ($p < 0.001$) as compared with the younger age group ($p < 0.01$) on the measure of reading awareness. Such findings may suggest that the 10 to 11 year olds were more receptive to training because they were more developmentally mature and able to accommodate the new learning experiences. Certainly from the research discussed previously, the younger the children, the less metacomprehension awareness they appear to have, and therefore the less 'ready' they might be to take on new information (e.g., Paris and Jacobs, 1984).

Explanations in relation to the effects of training for older and younger readers are confusing since one could, using the same rationale as above, argue the opposite case. Thus, the younger readers, having less knowledge in the first place, might be expected to benefit more from training. It may be that the greater statistical effect for the older readers reflects the general trend for metacomprehension and strategic reading to become more congruent from age 8 to 10 years of age (Cross and Paris, 1988).

The above studies were replicated by Paris and Oka (1986) and Paris, Saarino and Cross (1986), but with the class teachers implementing the programme rather than the researchers. This was a major difference considering the nature of metacomprehension training. The success of a metacomprehension programme will depend on the trainer having a sound understanding of how children learn to read, and the type of knowledge which they are likely to have at different ages. With such knowledge it is more likely that trainers will be able to teach children metacomprehension strategies. It might be assumed that the researchers in the previous studies were well informed about children's reading development, and would therefore be in an ideal position to

teach children explicitly, what, how, when and why to apply particular reading strategies. Such an assumption cannot be as readily ascribed to teachers. In fact, from the evidence provided by Durkin (1981; 1984) in relation to the type of materials with which teachers are familiar, it might be assumed that they would not be entirely conversant with metacomprehension approaches to teaching reading comprehension.

Given the above, it was important to assess whether or not the strategies taught in ISL by the researchers could be as easily taught by classroom teachers. The follow-up studies by Paris and his research team therefore had important pedagogical implications.

Paris and Oka (1986) trained forty-six teachers to implement ISL to 500 children with a mean age of 8yrs 6mths, and 500 children with a mean age of 10yrs 6mths. The teachers' training took place during four separate workshops and through periodic meetings during the year in which the research programme ran. The details of the training provided for the teachers are not discussed, but it is stated that the main task of the researchers was to persuade teachers of the importance of comprehension strategies and in so doing, to help encourage their students as to their value. It was reported that whilst taking the teachers through the material it became apparent that the programme provided them with *"a wealth of new information about cognitive strategies ...as well as innovative methods and materials."* Again, such a finding is not surprising given the evidence already reported by Durkin (1981; 1984), and Hare and Milligan (1984) in relation to the content of most mainstream reading comprehension programmes.

The experimental classes in Paris and Oka's study were compared with 600 children from 25 control classes who received their normal curriculum (i.e., basal reading schemes). The measures used for pre- and post- testing were principally the same as those used previously by Paris, Cross and Lipson (1984) and Paris and Jacobs(1984). In addition to the hard measures provided by the Gates MacGinitie Reading Test, cloze and error detection tests together with the reading awareness questionnaire, Paris and Oka also introduced a number of attitudinal and

motivational scales. These were:

i) a specially designed self-perception questionnaire, scored using a 5 point Likert scale and used to measure children's' perceptions of themselves as readers (e.g., "I think reading is very difficult for me":- 1= disagree and 5= agree),

ii) the Cognitive and Social sub-scales of Harter's (1982) Perceived Competence Scale for Children. The cognitive scale assesses children's perception of themselves as learners within the classroom situation and the Social scale measures their perceptions of themselves as social beings (i.e., ability to make friends, general popularity), and

iii) the Mastery and Curiosity subscales of the Intrinsic versus Extrinsic Orientation in the Classroom Scale also by Harter (1980). The Mastery Scale measures the extent to which children see themselves or a teacher as being in control of their learning, and the Curiosity Scale assesses children's intrinsic motivation for doing school work, as compared with the feeling that you do it because you are told to.

The researchers were interested to assess not only whether ISL improved children's reading awareness and comprehension skills, but also if perceptions of themselves as readers and learners influenced the effects of the instructional programme. As with the previous studies, two age groups (8 to 9 year olds and 10 to 11 year olds) were taught using ISL so as to measure any differential effects of training. In addition, each age group was divided into good, average and poor readers, determined by their pre-test scores on the Gates MacGinitie.

The results from the study corroborated those of the previous studies. All children, irrespective of age and reading ability, made significant gains on the cloze and error detection measures but not on the norm-referenced comprehension test. In the cloze test, the high level 8.6 year olds made the smallest gains, with the largest gains being achieved by the high level 10 year old children. The reasons given by Paris and Oka for the lack of significant scores in the comprehension test were the same as those provided previously. The effects of ISL were therefore positive

in terms of increasing children's awareness of reading strategies, and their ability to perform in a cloze test and to detect errors. Such effects were obtained by the children's own class teachers, providing encouraging evidence for the efficacy of training teachers to teach children how to comprehend.

The measures used to assess motivation and attitudes appeared to be more correlated with reading achievement amongst older and better readers. The older or more competent the reader, the more the influence of motivational and attitudinal variables. Such results would suggest that the influence of non-cognitive factors becomes more of a factor in determining reading performance with increasing age and aptitude. However given that the data are correlational it is difficult to arrive at any firm conclusions regarding causality.

#### *2.5.3.3 Some questions*

'Informed Strategies For Learning' comprises one of the first, multi-strategy metacomprehension programmes designed for use by teachers in schools, to help children become strategic comprehenders of text. It is also one of the most comprehensively evaluated programmes, demonstrating positive gains in children's metacomprehension. No other similar instructional materials appear to have been developed within the UK, where the teaching of reading does not seem to have an explicit metacomprehension agenda. It will be argued in Chapter 3, that the 5-14 Guidelines for English Language (SOED, 1991), makes implicit references to what might be interpreted as metacomprehension strategies but fail to develop the concept as an explicit aim, or provide guidance as to how teachers might achieve such outcomes.

Although the work by Paris and his colleagues is encouraging there are still many unanswered questions. For instance, it may be that the positive effects of training reported by Paris et al were unique to ISL, and that other metacomprehension programmes would not have produced such improvements in metacomprehension. Alternatively, a different instructional programme, or a re-ordered ISL may have been more effective. Perhaps some activities in ISL were more important than

others in promoting metacomprehension awareness. Is ISL culturally bound or would it be as effective in a Scottish context?. Nisbet and Shucksmith (1986) certainly felt that it was necessary to structure input for Scottish teachers if they were to be encouraged to teach children to be metacognitively aware. This is highlighted by the following quotation taken from the field notes kept by teachers participating in Nisbet and Shucksmith's research:

*"The teachers' general reaction was that something more structured and easy to follow was needed. To quote from the field notes again: Teachers don't mind putting in the effort to think things through, prepare new materials, set up resources and rearrange their syllabus..... but the effort of doing this for every class and every task becomes an overwhelming burden without more specific guidelines and routines."* (p. 85). Perhaps the lack of structure explains why Nisbet and Shucksmith's early research has lain dormant for so long.

The implementation of ISL produced positive effects on two of the three outcome measures, that is the cloze and error detection tests. No significant results were obtained from the norm-referenced comprehension test. Paris, Cross and Lipson (1984) suggested that failure to detect change in the comprehension measure was due to the way in which norm-referenced comprehension tests are constructed, arguing that they measure cognitive ability rather than specific knowledge and strategies related to comprehension. However, an alternative explanation for the apparent lack of change in children's comprehension might be found in the measures used to assess the impact of ISL together with the aim of the instructional programme.

It will be remembered from the discussion in Chapter 1 that both cloze procedure and error detection are indirect measures of metacomprehension, relying on the application of metacomprehension strategies for successful performance. Comprehension tests are not measures of metacomprehension but are instead, measures of the 'cognitive goal' (vis.- a-vis. Flavell, 1979; 1981) resulting from the application of both cognitive and metacomprehension strategies. Failure by Paris and his colleagues (Paris, Cross and Lipson, 1984; Paris and

Oka, 1986) to detect any change in children's comprehension after intervention may therefore, not have been due to the construction of norm-referenced comprehension tests as argued by them, but to the fact that the intervention programme aimed to teach metacomprehension strategies rather than comprehension skills. One might in these circumstances expect to detect changes in measures designed to assess metacomprehension, as compared with those designed to measure changes in comprehension.

However, even if one accepts the above explanation it is still disappointing that improvements in metacomprehension, as measured by the cloze and error detection measures, did not significantly improve comprehension. Perhaps a more sensitive measure of changes in comprehension resulting from metacomprehension instructional programmes would have been provided by a self-produced comprehension test, as suggested by Rosenshine and Meister (1994) and argued by the present author in Chapter 1. A self-produced comprehension test comprising literal and inferential questions may be more likely to detect changes resulting from intervention because it would be able to detect subtle changes in the readers' level of comprehension. This relates to the definition in Chapter 1 (page 21), where it was indicated that metacomprehension is concerned with, amongst other things, the *"awareness which readers' have of their level of understanding whilst reading ..."*

Given the above arguments, it would seem reasonable to suggest that self- produced comprehension tests which sample literal and inferential question answering abilities are likely to be a more appropriate measure of change resulting from metacomprehension instructional programmes.

Finally, it has been noted that Paris, Cross and Lipson's (1984) instructional programme grew out of the metacomprehension research literature which emphasises the importance of self-regulation, organisation and monitoring of one's cognitive processes. It is surprising therefore, that the teaching of self-monitoring skills occurs at the end of 'Informed Strategies for Learning' rather than at the beginning. If the

order of presentation indicates an implicit order of importance, then the self-regulatory aspects do not seem to appear as prominently as one might expect.

Such a lack of emphasis on the relative importance of different skills and strategies within metacomprehension programmes may be indicative of their embryonic stage of research development. The applied empirical data does not provide sufficient information about the relative role(s) of, and inter/intra dependence of, the different strategies used in metacomprehension programmes. However, it would appear to the present author, that a significant difference between traditional cognitive, as compared with metacomprehension, methods of teaching comprehension skills, is the self-regulatory, and monitoring aspects. Making overt the covert thinking processes underlying the interpretive aspects of reading comprehension would seem to be a central component of metacomprehension instruction. If this is the case then it would seem important to spend time at the beginning of a metacomprehension programme, teaching readers to be aware of their comprehension as they read, encouraging them to monitor, select and orchestrate their cognitions in the pursuit of better understanding. It will be seen in Chapter 5 that the present thesis tests out this hypothesis by constructing a teaching programme where the self-monitoring aspects appear prominently in the beginning lessons. This contrasts with Paris, Cross and Lipson (1984), where the self-monitoring lessons appear at the end of the instructional programme.

## 2.6 Teaching teachers to be aware of their metacomprehension behaviour

It will have become apparent from the research reviewed, that metacomprehension strategies cannot be taught as a list of activities, otherwise what is being taught is simply a hierarchy of core skills which are never used strategically in response to the self-monitoring of one's own cognitive processes. Metacomprehension must by its very nature, be taught flexibly and reflectively, requiring the teacher to interact with the learner, explicitly directing and modelling for them, the cognitive processes involved in comprehending text. This is a tall order for

teachers who according to the research literature are not generally exposed to such concepts within mainstream reading schemes (Durkin, 1979; Paris, Wasik and Van der Westhuizen, 1988; Clark, 1996). It is surprising therefore that few of the empirical research programmes have looked at teaching teachers in the implementation of metacomprehension strategies. In addition, it will be apparent that most of the studies reviewed have involved the researcher in implementing the programme with the exception of Palincsar, Brown and Martin (1987) and Paris and Oka (1986). It is interesting, therefore, to reflect on what happens when teachers are taught how to implement metacomprehension programmes.

Relatively few studies have been specifically designed to look at teacher behaviour and knowledge resulting from metacomprehension training. Notable exceptions are those by Duffy, Roehler, Meloth, Vavrus, Book, Putnam and Wesselman (1986; 1987). Their research is discussed in order to demonstrate the needs of, and benefits to teachers, of instruction in the delivery of metacomprehension programmes. It will be argued that to ensure teachers are confident in the application of metacomprehension strategies, they should be given structured guidance and the opportunity to experience their own metacomprehension.

Duffy et al. taught a group of fifth[4], and later (1987) third grade[5] teachers how to:

1. *"recast prescribed basal text skills as strategies useful when removing blockages to meaning,*
2. *make explicit statements about the reading skills being taught, when it would be useful, and how to apply it and*
3. *how to organise these statements for presentation to students"* (Duffy et al., 1986, p. 244).

The teachers were therefore being taught to use direct explanation as a teaching methodology to provide the children with an awareness of their

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4 5th grade = P6: mean age 10yrs 5mths

5 3rd grade = P4: mean age 8yrs 5mths

cognitive processes, and to help them in the selection and organisation of their knowledge of comprehension procedures. Of interest to the present discussion is the finding that, over a 6 month period, teachers provided more direct explanations about reading strategies, than when they started the programme. However, Duffy et al. noted that whilst the majority of teachers improved in their use of direct instruction it was evident that some of the teachers still found it difficult even after 6 months of training, and were as a result, inconsistent in their application of the training methods.

Similar findings are reported by Palincsar, Brown and Martin (1987) who spent several days teaching tutors to use the strategies of reciprocal teaching and commented on the importance of such time and effort to obtain positive outcomes in terms of children's improved comprehension.

The studies described do not provide detailed information about the nature of the training provided for the teachers, and the observations of teachers' behaviour are open to misinterpretation. However, they do suggest that future research should take into consideration the instruction of teachers. The present author would argue on the basis of the above evidence, together with that of Nisbet and Shucksmith (1986), that it is important to provide teachers with the opportunity to experience their own metacomprehension so as to provide them with an insight into the very strategies which they should be teaching children.

## 2.7 Conclusions: How does metacomprehension research inform practice?

From the above review of the literature there would appear to be a number of significant findings influencing the development of future instructional programmes:

1. Children are generally not taught **how** to comprehend.
   Observations of school classrooms and analysis of common text books suggests that little time is spent on teaching children how to read for meaning (e.g., Durkin, 1981; Hare and Milligan, 1984; Silven, 1991).

2. Children's metacomprehension knowledge about reading increases with age. There is an apparent progression in metacomprehension with age and greater congruence occurring between the ages of 8 to 10 years (Cross and Paris, 1988). Children below the age of 8 years of age appear to have very limited metacomprehension awareness and knowledge (Johns and Ellis, 1976; Myers and Paris, 1978; Canney and Winograd, 1980; Paris and Jacobs, 1984).

3. Poor, like younger readers, exhibit limited metacomprehension knowledge and awareness (Paris and Myers, 1981; Garner and Kraus, 1982; Malone and Mastropieri, 1992). The implication is that limited metacomprehension awareness and knowledge inhibits reading progress, and that if children are given such skills, their reading comprehension will improve. Such an hypothesis would seem to be supported by the success of instructional programmes (e.g., Palincsar and Brown, 1984; Paris, Cross, and Lipson, 1984; Paris and Oka, 1986; Paris, Saarino and Cross, 1986;.Bruce and Jones, 1991; Baumann, Seifert-Kessell and Jones, 1992).

4. Training children to monitor, regulate and orchestrate their reading behaviour and to respond using appropriate reading strategies, improves reading awareness and comprehension abilities for all children, but particularly poor readers (Singer, 1978; Palincsar and Brown, 1984; Baumann, Seifert-Kessell and Jones, 1992).

5. ***Self-regulation*** and ***explicit*** training of metacomprehension strategies are important components of instructional reading comprehension programmes (Baumann, 1982; Baumann, 1984; Brown, Armbruster and Baker, 1986; Schunk and Rice, 1987; Silven, 1991).

6. Good reading instruction will involve teaching children declarative (metacomprehension knowledge of person and task), procedural

(metacomprehension knowledge of strategies) and conditional knowledge (metacomprehension experiences).

7. Before teaching children to apply metacomprehension strategies it is important to instruct teachers about such strategies. Ideally this should enable teachers to experience their own metacomprehension behaviour. Training should also convince them of the usefulness of metacomprehension training, and provide information about the underlying conceptual framework necessary for them to adapt and reflect on their teaching practice (Paris and Oka, 1986; Paris, Saarino and Cross, 1986; Duffy, Roehler, Meloth, Vavrus, Book, Putnman and Wesselman, 1986;1987; Palincsar, Brown and Martin, 1987).

8. Research indicates (i.e., Paris and Oka, 1986) that motivational and affective aspects of development are more influential in predicting performance of older, than younger children in reading comprehension activities. However, the results of these studies should be viewed with caution being correlational in design, and confounded by definitional difficulties (Burden, 1996).

There would seem to be sufficient evidence to suggest that the teaching of metacomprehension strategies is a useful, if not essential aspect of training children to independently comprehend narrative texts. It is therefore, surprising that very little empirical or practical research has been conducted within the classroom setting, particularly within the Unitied Kingdom. More practical empirical research designed to teach teachers to instruct children in how to monitor, regulate, and orchestrate their reading behaviour in the pursuit of better understanding is required. Such teaching should be explicit, aimed at poor and or young readers, and designed to make covert processes overt to the reader. It will be argued in Chapter 3 that such practices are implicitly stated within the 5-14 English Language Curriculum guidelines (SOED, 1991), and that a novel should provide a useful vehicle for teaching metacomprehension strategies.

# Chapter 3: The Learning Context - the 5-14 English Language Guidelines and the Use of the Novel Study

## 3.1 Introduction

It was noted in Chapter 2 that the 5-14 curriculum for English Language makes implicit references to what might be interpreted as metacomprehension strategies. Given that the document is designed to guide teachers in the delivery and content of the language curriculum, it is important to consider its recommendations in light of the metacomprehension research discussed previously. Chapter 3 will look respectively at the 5-14 English Language programme, and the use of the novel as a teaching resource for delivering some of the recommendations made within the document, thereby drawing together the three strands of theory, legislation, and practice.

## 3.2 The 5-14 English Language Programme

The 5-14 English Language programme was produced by the Scottish Consultative Council on the Curriculum (SCCC) for the consideration of the Secretary of State for Scotland. In its final form, issued by the SOED as Circular number 12/91, it forms part of the present government`s reform of the education system and is intended to act as a guide to primary and secondary teachers about what should be taught to children between 5-14 years in the curriculum area of English language. The document was first produced as a draft in March 1990, and was re-issued after consultation in its official form in June 1991. A large working party comprising a cross-section of the educational community, was involved in producing the draft. The final guidelines differ little in content from the draft; the present discussion will refer to the **official** document, making reference to any significant differences between it and the draft programme.

### *3.2.1 Structure of the document*

The Guidelines are organised into two main sections: Section 1 -attainment outcomes and targets expected of children from 5 to 14 years old, and

Section 2- examples of programmes of study which might be employed to achieve the targets outlined in Section 1. The English language curriculum is divided into four areas: listening, talking, reading and writing. Attainment targets and programmes of study are outlined for each of the areas, and at five progressive levels of attainment: Level A (attainable in the course of P1-P3 by almost all pupils) through to Level E (attainable by some pupils in P7/S1, but certainly by most in S2).

### *3.2.2 The 5-14 curriculum in relation to reading*

Of interest to the present study are the sections relating to the teaching of reading. It would be impossible to discuss curriculum matters without consideration of what is expected of teachers by the SOED, and it would be naive to embark on research which does not consider the realities of the classroom situation. Winograd and Johnston (1987) highlight this point when they comment on the negative effects which national guidelines can have on promoting more appropriate teaching agenda. In a Scottish context, the 5-14 guidelines have much to say about **what**, and **how** children should be taught. The fact that they are guidelines, rather than prescriptive programmes of study allows some flexibility as to the ways in which the curriculum is delivered (methodology), and the materials deployed to this end. Unfortunately, the curriculum is outcome driven: references to attainment outcomes and targets sets such a climate. This is contrary to the general feel of the document which is child centred, and concerned with promoting independent learners and thinkers. It may be that competing demands have caused a confusion for the writers; there was an expectation on the part of the State that a national curriculum would be set for all children in Scotland, and that progress could be assessed for each child by measuring their attainments against those outlined in the curriculum. It could be argued that the main aim of the SOED was therefore to assess rather than define appropriate curricula. Despite such difficulties the document has much to offer, and it is interesting to inspect the content in light of the research outlined in Chapter 2.

The reading section of the 5-14 programme emphasises the importance of reading for meaning, of developing children's awareness of the functions of print, of different styles of writing, and the development of reading strategies

designed to promote better understanding of printed material. The document states:

*The importance of* ***meaning*** [1] *should be stressed at all stages. The activity of reading should take place, wherever possible in an appropriate context and it should be concerned with the gaining of meaning from suitable text. Reading should always have a purpose which is clear to both the teacher and the pupil*` p. 36 par. 2

*At the earliest stages learning to read is dependent upon the spoken language that pupils bring to school. it will also be influenced by the knowledge they have gained ----- about the conventions of print itself.*` p. 36 par. 3.

`*As texts become more complex and various in form, the teacher needs to deploy a widening range of techniques such as* ***sequencing, prediction, cloze procedure, evaluating the text, making deductions, marking text, comparing and contrasting different texts***`. *These are best used as a stimulating means of leading pupils to explore and discuss meaning, rather than as 'right/wrong' assignments.* p.36 par. 4.

`*In longer reading activities for example novels,* teaching the ***strategies*** *which help them to make sense of aspects such as plot, characters and themes is essential*`. p. 37 par. 1

There are a number of points which can be made in relation to the above selected statements:

i) an acknowledgement is made that reading is about gaining meaning, and that to achieve this end, teachers need to deploy a number of teaching skills. In fact, the skills outlined in paragraph 4 page 36 are almost identical to those taught by Palincsar and Brown (1982) to children with reading comprehension problems, using reciprocal teaching as a methodology.

ii) The need for explicitness of teaching is emphasised in the statement about the purpose of reading (p. 36 par. 2). This is a very important point when one considers the research into metacomprehension training. One of

[1] all bold type within quotes are those of the author

the criticisms of the teaching of reading has been the lack of explicitness for both teacher and pupil. However, what one is explicit about is also important, and there is no attempt to elaborate this point beyond the explicitness of 'purpose'. From the research evidence it might be suggested that teachers should be encouraged to be explicit about their own thinking and behaviour, explaining and talking through for the children **how**, **when** and **why** they would apply certain skills to achieve better understanding. The teacher who naturally becomes involved in such interactions is often regarded as an empathic teacher. Such 'empathy' might actually be an example of good metacomprehension training.

iii) the use of novel studies is the only curriculum resource to which direct reference is made. It is also interesting that it is referred to in relation to the teaching of the higher order reading skills which resembled those taught in Palincsar and Brown's study. One might infer that the novel is being acknowledged as a sympathetic medium for teaching higher order reading skills.

iv) a progression of reading skills and knowledge is indicated by references to the need to develop early concepts of print, moving onto higher order comprehension skills. Unfortunately it is not explained why such a development in knowledge is important, how such knowledge can be directly taught to children, or if it should be explicitly taught. There is an assumption that such a progression will occur naturally by increased exposure to different genre and quantity of text. Certainly, the research evidence suggests that there is a developmental progression in relation to children's knowledge about print (Clay 1967) and comprehension strategies (Brown 1978), however not all children progress normally, and for those children experiencing reading difficulties, direct instruction seems to be necessary (Paris, Wasik and Turner 1991). It is also known that children are not exposed to a large quantity of literature (Gambrell 1984), and thus active steps would be needed to ensure the provision of a range of literature necessary for children naturally to acquire knowledge of print and higher order reading skills. With an overcrowded curriculum it is possible that exposure to literature becomes more , rather than less, limited. This concern is underlined when one considers that the minimum time

recommended by the SOED for the whole of the English language curriculum is specified as 15%, the rest being spent on other curriculum areas. The reality in most classrooms is that the minimum becomes the maximum time spent, and therefore it would not be surprising if children's opportunities of experiencing a wider range of reading material were limited in the classroom. Given such realities it might be argued that to ensure children achieve the targets outlined in the curriculum document, direct instruction would be desirable.

v) It is suggested in paragraph 4 page 36/7, that teachers should be deploying a widening range of techniques as a means of *'leading pupils to explore and discuss meaning, rather than to achieve right and wrong answers'*. The statement has been added to the original guidelines, underlining the importance of the point being made. The emphasis is on the processes involved in thinking rather than the outcome of such thought. This is an important point in relation to the theory on metacognition, since metacognition is by definition, thinking about thinking. In encouraging teachers to think more about process than product there is an implicit instruction to teachers to teach metacomprehnsion skills.

All of the above might be viewed as strengths of the document. There are clear indications that cognisance has been paid to the skills and knowledge which teachers and children require to become effective educators and learners. Unfortunately, the curriculum fails to make explicit the metacognitive aspect of teaching and learning. The document is concerned with outlining the declarative and procedural aspects of teaching reading, and omits the conditional. There are no explicit references to the need to teach children **when** and **why** to apply the skills outlined in the attainment targets and outcomes. In encouraging teachers to use a widening range of techniques such as sequencing, prediction and cloze procedure, there is no attempt at suggesting that they should also explain to the children **why** such skills are being demonstrated. It could be argued that this is implied in the statement, but given the document's previous plea for clarity of purpose, this should not be assumed. The document therefore emphasises skill rather than strategy. The summing up to the section on Reading highlights the skill bias:

*.....the teacher can focus on texts:*

***before reading,***

*- by priming pupils for the task, for example by alerting them to unfamiliar content or ideas;*

*- by directing them onto the task;*

***during and after reading,***

*- by providing questions which ask for literal, inferential, and evaluative responses p. 37 par. 2*

Good reading skills are being encouraged, but there is an important element missing, and that is an explanation of **when** and **why** to use such skills (i.e., conditional knowledge). It has been well documented that such an explanation is frequently omitted from teaching programmes and can prevent children from becoming strategic readers (e.g., Paris, 1986; Brown 1978;). It is also worthy of note that teachers are being asked to use literal and inferential questions, but as a means of assessing reading; it is not demonstrated how teachers might develop such skills in children. How does a teacher instruct children to formulate literal and inferential questions, and are these important skills for children to have? It has been argued that an ability to formulate one's own questions is an important skill since it allows children independently to begin to analyse text at a higher order level of understanding (Rogoff and Gardner 1984; Andre and Anderson 1978-1979).

In the programme of study section, Level C (attainable in the course of P4 to P6), it is stated that *"teachers will take pupils beyond purely literal responses, using appropriate questions to help them make inferences and decide on conclusions, supported by evidence." (p 40; Reading to reflect on the writers ideas and craft).* There is an assumption that by asking appropriate questions, children will incidentally learn to ask such questions for themselves, thereby allowing them to achieve a similar level of understanding without the teacher's direction. Incidental learning of this nature has not been found to be the case in the research outlined previously. Such an omission is tantalising, since the suggestion leads the teacher into a process of scaffolding and modelling, both methodologies shown to be useful in teaching children metacomprehension strategies

(Paris and Winograd, 1992), but only if they are used as a means to such an end.

Another important omission within the document is the lack of any reference for the need to develop self-regulatory behaviour. It has already been demonstrated that self-evaluation or monitoring of one's reading is an important prerequisite to reading with understanding, and becoming an independent strategic reader (Baker and Brown, 1984). Teachers are aware of the fact that some children decode without understanding (in fact it is quite normal for young readers to view reading as a decoding rather than meaning gaining exercise), and the 5-14 programme views reading as a meaning gaining exercise, but does not include in its attainment targets or outcomes any requirement for children to learn how to self-monitor. Given that as early as 1917 Thorndike had identified the importance of self-regulation in reading for meaning (e.g., *"The vice of the poor reader is to say the words to himself without actively making judgments concerning what they reveal"*) it is concerning that such behaviour is not promoted within the curriculum guidelines.

The research into metacomprehension does not appear to have significantly influenced the statements made within the 5-14 curriculum guidelines for English language. Much of what is hoped to be achieved, particularly in the area of reading comprehension, would require some metacomprehension input. From the research evidence presented in the previous Chapters, to teach metacomprehension skills effectively, teacher and pupils would have to be aware of the importance of meta skills, and **how**, **when** and **why** it was appropriate to use them, to aid comprehension. *"What is most important (*in relation to developing children's comprehension*), is for educators to realise that **action** must be taken to help children acquire effective metacognitive strategies"* (Kendall and Mason, 1982).

There is a danger that, because the 5-14 document does not acknowledge the importance of metacomprehension skills but leaves the reader to infer that the area of metacomprehension may have something important to offer, teachers will not actively incorporate metacomprehension training into their

teaching programmes. Failure to teach metacomprehension strategies may impede, or at worst prevent, children from reaching their potential in reading comprehension. Children experiencing learning difficulties will be particularly affected (Wong and Jones, 1981; Malone and Mastropieri, 1992), and the opportunity for progressing young readers will also be hindered. Without an explicit teaching objective which aims to teach children metacomprehension strategies, children will at best be furnished with skills, in the hope that the strategic use of such skills will follow incidentally. From the research evidence this might be considered a rather forlorn hope.

## 3.3 The Use of Novel Studies

The discussion so far has concentrated on the legislative framework in which the reading curriculum is delivered. Within such a context reference has already been made to the use of the novel as an extended form of study for the development of higher order reading comprehension skills. The question remains, why should such a teaching resource be a useful vehicle for the dissemination of the reading skills outlined in the 5-14 curriculum? In the following section the possible merits of the novel will be discussed with particular reference to its use in teaching metacomprehension strategies.

### *3.3 1 What is a novel and how is it used in the classroom?*

Novels are short narratives such as "Danny Fox" (Roald Dahl). They have been used in schools for a number of years as a teaching method designed to develop higher order reading comprehension skills. Higher order reading skills refer to language work not associated with the mechanical decoding aspects of teaching reading. Literal and inferential levels of understanding through the reading and analysis of text, would therefore constitute higher order reading skills. As indicated previously, the use of a novel to teach higher order reading skills is referred to in the 5-14 curriculum as a useful teaching resource (p37 par.5). Typically the teacher will take a novel and read part of it to the class. She will then discuss the section read and ask oral comprehension questions which involve the children in using literal and inferential comprehension skills. (e.g., *'what was the name of the boy in the story?'* (literal); *'Why do you think the boy*

*behaved badly?'* (inferential)). She may then reinforce the oral discussion through some related drama, an art and craft activity or a written exercise (e.g., a cloze passage, or a piece of writing requiring the child to 'finish' the story thereby using prediction and inference). The intention would be, that during a 6 to 8 week period, the story would gradually unfold for the children as more of the book was read by, or to them. As time progressed and more of the novel was read, the children would become more involved with the characters, developing a growing understanding of the plot and structure of the story. The 'novel' approach differs from that obtained through the use of reading scheme material such as Ginn 360, where the emphasis is on the mechanical aspects of reading, and the reading material is designed to be within the independent reading age of the child. The novel on the other hand may stretch children's reading skills because much of it is read as a group or by the teacher, thereby providing support and guidance, and allowing readers to cope with material beyond their independent decoding level. It may also be that because the children are involved in an evolving story, they are more able to draw on personal experience and use the story schema as a means of filling in the missing cognitive gaps. This is less likely in disconnected texts.

Reading schemes comprise short extracts or fictional accounts, limiting the development of plot, and inhibiting the engagement of children in the unfolding story which is apparent in novels. Certainly in some schemes such as Oxford Reading Tree (Oxford University Press, 1987), the same characters appear at each reading level and there is an attempt at cohesion and consistency across the scheme by involving the characters in different problems and activities. However, the development of a rich and stimulating plot and story structure is hindered by the competing need of maintaining a reading level which matches the child's decoding skills.

Wilson and Anderson (1987), drawing heavily on the work of Anderson, Armbruster and Kantor (1980), note that most texts used in school classrooms *"often consist of little more than lists of loosely related facts where the real point is not clear, or stories without problems for characters to solve ..... Educators must demand effectively structured texts from textbook publishers"*. Novels by their very nature provide the kind of structure and thematic unity sought by Wilson and Anderson.

A similar argument in relation to research is made by Winograd and Johnston (1987) who state that: *"a major concern with applied comprehension research is the tendency for instructional techniques to displace time spent actually reading real literature"*. Quoting from research conducted by Gambrell (1984), they highlight their point by noting that *'children in first, second, and third grades read connected text for a mere 3 min, 5.5 min, and 5.75 min per day, respectively'*. Such limited interaction with real literature, they argue, limits exposure to vocabulary, different story schema, and naturalistic contexts for reading for meaning. Given that such variables are important in comprehension, the use of real literature should be an important tool within the class room.

## 3.4 The influence of motivation in reading outcomes and the role of the novel.

When teachers are questioned about why they use a novel they tend to focus on the affective rather than the cognitive/developmental advantages. They will say things like: "we use the novel because the children enjoy the story"; "it is more motivating than the basic reading scheme"; "it is a bit different from the normal approach to reading and this captures the child's imagination". Enjoyment and interest leading to increased motivation and engagement in the task is certainly an important reason for choosing a particular teaching method. However, it is known that the affective aspects of learning also have an impact on the acquisition of cognitive skills and strategies. In a review of the subject, Borkowski, Carr, Rellinger and Presley (1991) make the point that:

*" although motivational states often direct and energize human behaviour, they also play more subtle roles in determining the actual strength, shape, or functioning of cognitive processes"*. It is therefore important when considering the use of a novel as a medium for teaching reading, and in particular metacomprehension skills, to regard both the affective and the cognitive elements.

In relation to the cognitive process of reading comprehension, Paris, Lipson and Wixon (1983) note that: *"Readers are most likely to be strategic, purposeful, and goal directed (*all components of metacomprehension*)*

*when they are involved in reading materials they find personally relevant".* Children need to see the personal value of applying cognitive skills before they are likely to chose to use them in new learning situations. You can take a horse to water but you can't make it drink. Motivation and interest may be the key to making the horse drink!

The novel should be enjoyable and interesting, engendering high levels of engagement and involvement. Obviously this can not be guaranteed since each individual will have personal likes and dislikes. However, if carefully chosen, it is more likely that children will find a complete story of interest, than a reading scheme comprising of disconnected texts, or short stories contrived to conform to a readability agenda. Such reading material does not allow the children to become involved since the story is over before it has begun. The novel therefore starts with the advantage of being intrinsically interesting.

In addition to the general interest and enjoyment factor, the novel is concerned with the processes involved in reaching an interpretation. There are no right or wrong answers. It is therefore more likely to result in feelings of success for the learner. Experiences of success increase self-esteem, thereby encouraging further interest and motivation to become involved in the activity. The relationship between success and future learning has been well documented in the literature (Seligman, 1975; Covington, 1987). Children who experience repeated failure will develop low expectations about their abilities and tend to attribute success in learning, to ability rather than effort. Such attributions militate against future learning since it results in learned helplessness. Such a phenomenon is thought to be more pronounced in low attaining children, possibly because they experience more failure earlier in their school careers (Gardner, 1957; 1958; Gruen, Ottinger and Ollendick, 1978). Success, increased motivation and high self esteem in relation to learning are important factors in teaching and learning. In the area of metacognition it could be argued that they are essential, since motivation provides the desire to self-monitor and evaluate one's own learning (Weinert et al., 1987). It is suggested that the novel may provide a more success orientated curriculum resulting in high levels of expectations, commitment and engagement on the part of the children. As Borkowski et

al claim: *"...children who feel good about themselves and their ability-those who are intrinsically motivated to learn and who have effort related attributions are more likely to believe in strategic (ie metacognitive) behaviour and to develop complex, mature strategy knowledge"* p. 64.

Such hopes for the novel as a medium for teaching reading, may be regarded by some as ambitious, or over stated. Certainly the research in the area of attribution theory, self-esteem, and motivation is controversial. Add to this the relationship of such variables to the study of metacomprehension, and the picture becomes even more speculative. However, the possible effects of motivation on learning can not be ignored, and appear to be the principle reason for teachers using the novel as a teaching medium. Such a choice implies an intrinsic feeling on the part of teachers, that the novel has something special to offer children, something over and above what is provided by mainstream reading schemes. It is posited that part of the *something special* is the novel's ability to engage children in an enjoyable imaginary experience, which is non-threatening and success orientated. However, enjoyment is only one part of a much bigger cognitive and metacognitive picture.

## 3.5 Schema theory and the novel study

Whilst the positive affective aspects generated by the use of a novel are important, it may be argued that there are more compelling reasons for feeling that the novel is a good instructional resource. Motivation is important for all learning not just in the area of reading comprehension. What other aspects of the novel are important in the teaching of reading? Research in the area of schemata provides some insight into how the novel may aid comprehension.

According to Wilson and Anderson (1986) a schema is ***"an abstract structure of knowledge"***. It is structured because it represents relationships between events or information, and it is abstract because one schema can be used to interpret a number of different types of incoming information. For example one could have a schema which represents knowledge and information about *dogs*. New information about dogs could be added to the existing schema which could be elaborated by adding

information about related species (e.g., information about wolves and foxes). A new schema will have been created i.e., a *canine* schema. Schemata are important for comprehension since they provide knowledge structures which aid interpretation of input, and allow for the generation of inferences (Graesser, 1981). Rumelhart and Ortony (1977) view schemata as the key units in the comprehension process. They believe that well tested schemata can be used to predict and to make inferences. For them, schemata formed from everyday experiences and interactions with texts and other knowledge sources, play an important role in the ease or otherwise with which we interpret events. From a review of the research literature, Wilson and Anderson (1986) identified six functions of schemata in relation to reading comprehension. They claim that a schema:

i) allows text information to be structured enabling new inputs to be slotted into the appropriate schemata

ii) directs the reader's attention by allowing them to concentrate on using text information which links into an existing schemata

iii) enables inferential elaboration by filling in the missing bits of information, thereby allowing the reader to move beyond the literal to the inferential

iv) allows an orderly search of memory

v) facilitates editing and summarisation

vi) permits inferential reconstruction by filling in the gaps in one's memory of the text.

What a child knows about a topic (i.e., the schemata which they have been able to develop) will influence what they are able to use later in order to make inferences. The way in which the novel is taught should facilitate children's use of background knowledge in relation to the text. As the novel is read, a growing body of knowledge begins to be built, extending and elaborating the children's existing schemata. For example, if the story is about a fox and hens, the children will begin to acquire, through the reading of the book and classroom discussion, information about foxes and their predatory relationship with hens. Such knowledge will set certain expectations about what might happen next in the story. Information, previous experience, and knowledge about the temporal and structural aspects of fiction will support the children in interpreting and predicting

possible outcomes, resulting in better comprehension. The very nature of the novel should enable children to develop such skills. As Beck (1985) noted, themes help to avoid the need to set the scene each time a passage is studied. The theme can build on what has gone before, thereby aiding the teacher's and children's efforts in understanding:*".....selections in basal readers ought to be organised into topical units. With this kind of grouping, teachers could do a good job of building prior knowledge for the entire unit, and thus prepare children for several weeks of work. Each new assigned reading would not require an elaborate new introduction, but could be treated in relation to what had gone before".* (Beck, 1985) The use of a novel provides a natural 'theme' since it builds, chapter by chapter, on what has gone before and as such may even be preferable to that advocated by Beck (i.e., contrived topical units), allowing the group to share very similar, if not identical schemata (Beers, 1987). In this way the novel allows the teacher to focus on a narrower breadth of knowledge and information in relation to the text, activating a more discrete range of schemata than is likely when disconnected texts are used to teach comprehension. In doing this, the children can concentrate more on the meaning of the text, drawing on well developed schemata.

### *3.5.1 Story Schema*

Not only may the novel help aid understanding as outlined above, but it also provides a structured text producing a schema in its own right: a story schema. It has been suggested that children who have a well developed story schema can use this to aid comprehension (Stein and Glenn, 1979; Mandler and Johnson, 1977).

Rumelhart (1975) in his now seminal paper *"Notes on a schema for stories"* outlined a grammar which could be used to describe most story forms. Basically a good story introduces the characters, sets a problem which needs to be resolved, and ends with a resolution to the problem. The story schema therefore sets out a number of events or episodes in a temporal order. Stein and Glenn (1979) identified six causal relationships which normally occur in fiction:

1. **Setting:** introducing the protagonist, context in which the story events occur.

2. **Initiating event:** an action or event occurs to which the protagonist needs to respond
3. **Internal Response:** an emotional reaction is stated in relation to the initiating event
4. **Attempt:** an action or actions occur to resolve the/attain the goal set out in the beginning
5. **Consequence:** An event occurs marking the attainment or otherwise of the original goal
6. **Reaction:** The protagonists feelings about the outcome are explained

Some researchers would suggest that there is a hierarchical structure to the story schema. (Black and Bower, 1980; Omanson, 1982a). Events or information closely related to the problem, the protagonist's goal, and the eventual solution, being highest in the hierarchy.

Such story schema have been found to aid even young children's ability to infer. Thus Stein and Glenn found that stories which had a well structured schema such as that identified above were more likely to elicit positive responses to 'why' questions by six year old children, than were stories which had a disordered non-conforming schema.

It might be argued that real literature is more likely to have a well developed story schema, than short pieces of text produced for a reading scheme. The novel, in conforming to the structure of 'good literature' outlined by Stein and Glenn, should provide a story schema which will aid children in the recall of information and in their ability to infer and predict. That is not to say that reading scheme material could not achieve a similar goal, but only that it is less likely given the competing needs of developing mechanical reading skills and comprehension.

## 3.6 Socially mediated learning

It could be argued that the use of a novel encourages "socially mediated teaching and learning"; a central concept to the theories of Vygotsky (1978: Mind in Society) and Bruner (1972). The novel provides a social learning context for sharing experiences and insights around a common subject. In

many respects it is similar to the use of 'stories' by some cultures to pass information down through the generations. If one imagines the classroom situation during the use of a novel, children will be listening to each other or to the teacher read from the book.

Assuming that the story is interesting, the children will become engaged in the fiction, sharing in an imaginary experience to be discussed later and interpreted. The novel links the pupils and teacher, possibly acting as a mediator for future learning.

The novel study allows the teacher to ensure that all of the children have access to the same information and share in a common experience. They can then move forward, using the shared information and understanding, to extend and develop their skills. In many ways such an experience is similar to that described by Bruner in relation to children's language acquisition. Bruner emphasises the importance of reciprocity between infant and mother and notes that language occurs within the context of "an action dialogue in which joint undertakings are being regulated by infant and adult". It is hoped that the novel allows such joint undertakings to take place between teacher and pupil, allowing them eventually to 'speak the same language'. Just as with Bruner's descriptions of mothers' early interaction with their infants, it is possible to observe the teacher providing most of the input in the early stages of using a novel. Gradually as the pupils become more involved and share more of the same context with one another, a more equal relationship occurs. The children begin to take a more active role in their learning, leading to greater reciprocity of interaction with one another and around the text, and ultimately more responsibility for their own thinking and learning. Independent learning and self-regulation are important components of metacomprehension.

The discussion which takes place around a novel allows the teacher to model for the children her own thinking processes. She can demonstrate how to frame a question, what to do when they begin to lose track of the story, where to look for key information, and when and why it is necessary for the children to use their own previous knowledge and experience. During the learning and teaching process involved in reading and discussing the novel, in questioning and interpreting, the children are being

guided towards their zone of proximal development (i.e., *"the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers"* Vygotsky, 1978, p. 86). The novel provides teachers with the vehicle to structure and frame their input, helping to guide the children towards the intrapsychological plane (the point at which the child internalises information and knowledge, once socially mediated). Such an achievement allows children to be independent of the adult and might be regarded as a prerequisite for strategic reading.

It has been argued that the novel provides a social context for teaching and learning which is sympathetic to the way in which children learn. This is different from the classroom scenario present when using reading scheme materials. In such situations the children are organised into groups, differentiated according to their reading ability. Ability grouping excludes some members of the class from the discussions and inhibits the use of peer modelling for advancing learning. It also limits the body of knowledge and information available since there are fewer contributors to the discussion. More importantly, the emphasis for teaching may be subtly different since the material is ability graded, placing emphasis on accuracy and performance (i.e., outcome driven), rather than the processes involved in reaching an answer. For children to learn how to learn from reading it is important to teach comprehension strategies, which entails an emphasis on teaching children to think about their thinking processes as they read.

Additionally, an outcome driven curriculum creates a competitive environment which seems to militate against the kind of socially mediated learning which Vygotsky describes. It may also encourage teachers to concentrate on children's actual, rather than their potential, development. The novel study creates a more relaxed context for learning where discussion, enjoyment, and interaction around a text are emphasised. Such a learning environment is more naturalistic, and it may be argued, more likely to create independent learning. Winograd and Johnston (1987) in a discussion about teacher accountability and the teaching of comprehension state: *"We are concerned that the pressures of*

*accountability may cause teachers to focus on reading as if the transfer of information were the only concern, and thereby ignore reading as a way of developing relationships with children and relationships as a way of developing children's reading. We feel strongly that an essential aspect of learning to read is the rapport that develops when teachers take the time to share the pleasures of reading with their students"* (p. 226). The importance of social interaction for teaching and learning are underlined by the above comments, drawing heavily on the work of Vygotsky and Bruner. Whilst the novel is not the only vehicle for creating a sympathetic teaching and learning environment, it might be argued that it has many of the requirements, inherent in its very structure.

## 3.7 Conclusion

In selecting the evidence to support the hypothesis, that novel studies are a useful vehicle for teaching reading comprehension, it is important to emphasise that without cognizance on the part of the teacher of the possible advantages in using the novel, it is unlikely that the medium will be effective. As has been seen from the research on metacomprehension, it is important to be explicit about the teaching strategies being taught. If teachers are not clear about the reasons for using a particular approach, and the importance of story schema, background knowledge and socially mediated learning, then it is unlikely that such information will be used explicitly in teaching. The potential benefits of a novel study in such circumstances are unlikely to be realised.

It is also not the intention of the discussion to imply that the novel is the only instructional medium likely to promote effective learning and teaching in the area of reading comprehension. It is possible that with judicious use of other, more structured materials such as that provided in reading schemes, a talented teacher may achieve the same goals. However, it is likely that supplementary material would be required to achieve what is inherent within the novel.

The advantage of the novel over other teaching materials is that it lends itself to a more interactive mode of teaching, providing a social learning context, and a cohesion and form, which is not as readily achievable with

short extracts from books or from reading schemes designed principally around the decoding skills of the reader.

# Chapter 4: Research Method: Pilot Study

## 4.1 Introduction: the problem under investigation

It has been suggested in the introductory chapters that the area of metacomprehension has an important part to play in helping children to become strategic readers, yet most classroom teachers do not appear to teach comprehension skills (Durkin 1978 -79; Beck 1985, Roehler and Duffy 1991; Silven, 1992; Clark 1996), let alone metacomprehension strategies. Young and poor readers seem to have limited metacomprehension awareness and do not apply metacomprehension strategies to aid comprehension (Johns and Ellis 1976; Myers and Paris 1978; Canney and Winograd 1980;.Paris and Jacobs 1984; Paris and Myers 1981; Garner and Kraus 1982; Malone and Mastropieri 1992). Instead they seem to "bark at print" (i.e., decode without attaching meaning: see pp 60.for definition), failing to invoke remedial strategies when they lose track of the meaning. For such children there appears to be a need to teach metacomprehension strategies.

In addition to the research evidence which demonstrates the need for, and apparent benefits of metacomprehension training, increased impetus for such work is provided by the 5-14 curriculum programme in English Language(SOED 1991) which encourages teachers to teach higher order comprehension skills. In attempting to achieve such a target, it has been argued that children would need to be taught metacomprehension strategies. Without making such an agenda explicit it is suggested that the document is unlikely to achieve its objectives, since explicitness of training to both teacher and pupil has been shown to be one important aspect of metacomprehension instruction ( e.g., Silven 1992). Children need to be taught how to comprehend, and to do this effectively they need to be given cognitive and metacomprehension instruction. Within the framework of the 5-14 curriculum, this would involve a shift in emphasis from skill to strategy instruction.

Both research and the SOED curriculum guidelines for English Language would seem to justify the need for further investigation in the area of

metacomprehension.

In looking at the two strands of theory and policy, a further issue was addressed in the introductory chapters, that of the novel as a teaching vehicle. It is possible that different teaching approaches reflect different philosophies and consequent practice. Why do some teachers use novels to teach comprehension while some do not? It may be that the approach has been prescribed by a headteacher, or simply that it feels intuitively 'right'. Does it matter what teaching resources are used? It has been argued in Chapter 3 that the use of novels in classrooms to teach comprehension skills may provide a more sympathetic learning environment for the teaching of metacomprehension strategies than that provided by reading schemes. It is suggested that novels provide greater motivation and task engagement, promote interactive teaching and learning styles between pupils, and pupil/teacher dyads, and provide better structures and common knowledge schemata, than the disconnected texts used in reading schemes (e.g., Currie, 1997). Perhaps such features enable teachers and children to develop a context for teaching and learning which is more conducive to metacomprehension instruction. In using novels the teacher may unintentionally achieve some metacomprehension training due to the inherent properties of the instructional medium. Whilst this is unlikely because of the lack of overtness (metacomprehension requires explicitness of instruction and learning) it is a possibility which requires testing.

## 4.2 The research questions: Pilot study

In following the arguments outlined above and detailed within the introductory chapters, assumptions are made about what is, or is not, taught to children within Scottish classrooms. The motivation for the present research is based on the premise that metacomprehension strategies are not directly taught to children, and that to enable such instruction to be incorporated into the curriculum, children and teachers would have to have this as an explicit aim. It is also suggested that the novel would be a good vehicle for enabling such teaching. A starting point for testing out such assumptions is therefore to look at whether or not children are currently being taught metacomprehension strategies. The first research question for

the pilot study was therefore:

**1. Are children being taught metacomprehension strategies?**

If children are being taught metacomprehension strategies, does the method of presentation make a difference? Is a novel a more effective way of teaching metacomprehension than a mainstream reading scheme? A second question arises:

**2. Is there a difference in metacomprehension attainment when children are taught using a novel as compared with a mainstream reading scheme?**

Empirical data provided by metacomprehension research suggests that there are age and aptitude differences in children's acquisition of metacomprehension strategies. It has been demonstrated that children's metacomprehension awareness and application of strategies becomes more congruent between the ages of 8 and 10 years (Cross and Paris 1988), that older, as compared with younger readers demonstrate qualitative differences in their ability to describe and use comprehension strategies such as skimming (eg: Kobasigawa, Ransom, and Holland 1980), and that similar differences are apparent between good and poor readers (e.g., Paris and Myers 1981). Interesting questions from a learning difficulties perspective is whether or not children experiencing reading difficulties can be taught to overcome such problems by being taught metacomprehension strategies, and are they more likely to demonstrate changes in performance than good readers? A third question is therefore:

**3. Is there a difference between good and poor readers in their acquisition of metacomprehension strategies?**

Essentially, the pilot study was designed to investigate what was presently happening within the mainstream Scottish classroom in relation to the explicit or implicit teaching of metacomprehension strategies. Of interest

was whether or not the two different teaching medias made a difference to the teaching outcome, and if there was a difference in metacomprehension performance between good and poor readers. It was expected that the pilot study would help to inform the main study which was concerned with the production of a metacomprehension programme for use by teachers in the training of metacomprehension strategies.

## 4.3 Sample

60 children (mean age 9yrs 6mths) from six West of Scotland primary schools participated in the study. The schools were selected from a demographically matched group and randomly assigned to experimental and control conditions. All schools had matched populations in terms of the number of children in receipt of clothing grants and free school meals.

Primary 5 children (mean age 9yrs 6mths) were chosen because it has been shown that children of this age can benefit from metacomprehension training (Cross and Paris 1988). Equivalent experimental and control groups were achieved by matching the children's Burt Word Reading scores (Burt 1976). Thus, five children from each class and school were above average readers and 5 were below average, scoring 12 to 18 months above or below their chronological age (CA) as measured by the Burt Word Reading Test (Burt 1976). Independent t-tests indicated no significant differences in the scores of the experimental above and below average readers vs control above/below average readers, ($p > 0.05$ for both comparisons). The equivalence of the groups was further verified by the non significant differences in pre-test scores obtained on all three dependent variables (see tables 1b, 2c, 3c).

Of the children tested, only one needed to be replaced because their score on the Burt Word Reading Test was more than 18 months below their CA. The mean reading age for the above average readers was 126 months and for the below average, 93 months (mean CA 110 months). The difference between the above and below average reading scores within the control and experimental groups was significant ($p<0.001$), as measured by an independent t-test.

Thirty children, 10 from each of three different primary schools were in the experimental group and 30 in the control group. Those schools acting as the control group were not using a novel study to develop the language curriculum but were using a standard reading scheme (Ginn 360). The experimental schools had been using the same standard reading scheme prior to the research phase, but had transferred to the use of a novel for developing reading comprehension during the research period. The children in the control and experimental groups had therefore been exposed to similar language teaching experiences prior to the research. The three experimental schools were using different novels. Finally, children were drawn from different schools in the belief that this would allow the results to generalise beyond the effect of a single teacher.

## 4.4 Measures (Dependent Variables)

Three measures were used to determine changes in metacomprehension: cloze, comprehension, and question generating tests. Of the three measures used, the first two were drawn from previous research, and the third was a new application of the empirical evidence related to children's use of question asking for self-interrogation purposes (eg: Gavelek and Raphael 1985; Brown, Armbruster and Baker 1986). Indirect metacomprehension performance measures (i.e., cloze comprehension and question generating tests) were used in preference to those which are dependent on language ability, such as verbal reports and think-aloud strategies, because of the methodological problems related to such measures and detailed in Chapter 1. In addition, the use of cloze and comprehension tests as measures of changes in metacomprehension resulting from intervention have face validity since they are used frequently in similar intervention studies and so the results obtained from such measures may be compared with those from previous research using similar measures. The following section provides a description of the measurement tools used in the pilot study. For details of the underlying rationale the reader may refer back to Chapter 1.

### *4.4.1 Question Generating Technique.*

It will be recalled from the discussion in Chapter 1 that question generation is an indirect measure of metacomprehension based on the premise that

different categories of questions reflect differing levels of metacomprehension strategy development. It was argued, using Pearson and Johnson's (1978) categorisation of question types, that a move from textually explicit to textually and scriptally implicit questions should reflect increasing analysis of text and therefore increasing metacomprehension development. In using question generation as a dependent variable, it was hypothesised that as children developed better metacomprehension strategies their level of comprehension would increase, this would be reflected in the type of questions which they formulated as a means of monitoring their understanding whilst reading. A move from textually explicit to textually and scriptally implicit questions would reflect increasing analysis of text and increasing metacomprehension development.

Using the above rationale the following strategy was deployed. The children were given a passage to read pre-intervention and a different passage post-intervention. The passages were taken from the narrative section of Helen Arnold's publication " Making Sense of It" (Arnold 1984) which comprises passages sampling different genres of writing (e.g., narrative, autobiographical and historical) and requiring differing levels of reading aptitude (see Appendix 1a for QG test materials). Each of the passages is graded according to the calculated reading skills required to decode them. The calculations are made using the Fry (1968) and Spache (1972) formulae, both of which are recognised techniques for calculating the readability of texts. This information was used to ensure that the above and below average readers were given passages which were within their mechanical reading skill level. The children were asked to read the passage silently and were told that after they had finished they would be asked to pretend that they were the teacher and to ask the Experimenter as many questions about the passage as they liked and that the Experimenter (pretending to be the pupil) would try to answer them. In effect a role playing situation was established similar to the reciprocal teaching methodology applied by Palincsar and Brown (1984). No time limit was placed on the readers; testing stopped when the children indicated that they had 'run out of questions'. The data for each child consisted of lists of questions pre-and post-intervention.

### *4.4.2 Cloze Test.*

As described in Chapter 1 cloze procedure requires readers to read silently and provide the missing word(s) in a sentence so that it makes sense. A 'correct response' (as referred to above) is therefore defined as a word which makes sense in the context of the sentence, paragraph or passage. To perform proficiently in cloze procedure it was argued that readers need to apply metacomprehension strategies, in particular the self-regulation and monitoring of their reading behaviour. Children`s performance on a cloze test should improve with the development of metacomprehension strategies.

In the present study The Gap Reading Test (McLeod 1970) was used. It is a standardised norm referenced test with two parallel forms which can be used pre- and post- intervention and provides reading/comprehension age scores. The test was originally standardised on an Australian population of children but was restandardised on a randomised sample (N=1000) of British school children drawn from schools in Aberdeen, Glamorgan, London and Suffolk. The test compares favourably with other reading tests such as the Schonell B (correlation coefficient 0.73), and the two parallel forms were found to be positively correlated (correlation coefficient of 0.83), with a standard error of 2.76 points. Unfortunately, the manual does not provide a description of the sample in terms of numbers of children represented at each age range, sex, or socioeconomic variables. However, given that it was a randomised sample one might presume that the sample was representative of the population to be assessed by the test.

The main advantage of the Gap test as compared with more modern cloze tests is that it uses passages rather than single sentences. It will be remembered from the discussion in Chapter 1 that passages, as compared with single, unrelated sentences are more likely to stimulate readers into monitoring and regulating their comprehension of text since they require readers to integrate information across sentences, reading back and forth in the passage in order to maintain the meaning. Such skills are not as necessary when reading single short sentences of between 4 and 7 words. The disadvantage of the Gap test is the limited information provided in the manual regarding the standardisation and sampling procedures. It is also

an old test with, consequently, older norms which may be less likely to be representative of current readers' abilities. However, given that the test is being used in a pre- and post- controlled group repeated measures design, the same vagaries of test construction apply to both the experimental and control groups.

### *4.4.3 Comprehension Measure*

If the development of metacomprehension strategies is defined in terms of improvements in reading for meaning, then measures of reading comprehension, it has been argued, should reflect gains in metacomprehension. It was indicated in Chapter 1 that self-produced comprehension tests which include both literal and inferential questions are likely to be more sensitive to changes in metacomprehension development. The argument for this is similar to that already outlined in relation to question generation. Inferential questions require a greater amount of thinking, often requiring readers to draw upon prior knowledge, to integrate information across sentences and to read on and backwards in the text to find main ideas. Inferential questions, therefore, demand more sophisticated reading strategies and make greater demands on readers' metacomprehension strategies as compared with literal questions.

For the reasons outlined above and elaborated in Chapter 1, the present study used a self-produced comprehension test based on that used by Hansen and Pearson (1983). Five literal and five inferential questions were derived by the Experimenter from four short narrative passages taken from Helen Arnold`s `Making Sense of It` (Arnold 1984). The passages were different from those used in the question generating measure. As a means of validation, the questions formed by the Experimenter, and the passages from which they were derived were given to an independent judge (experienced in educational matters) who was asked to categorise them into the two question types (i.e., literal and inferential). On the basis of this information 90% agreement was obtained. The question where there was disagreement was changed until 100% agreement was obtained. In addition to this a sample of 20 children whose reading ages matched the readability level of the passages were given the accompanying pre- and post- test questions to answer. This was done as a means of determining

whether or not the questions were comparable, (i.e., a measure of the *reliability* of the pre- and post-test questions). The answers to the pre- and post- test questions were marked and a Pearson's r was computed producing a positive correlation of +0.78 ($p<0.005$; 1 tailed; df=8), indicating that the children's performance on the pre-test questions was positively correlated with their performance on the post-test questions for the sample described above. As with the QG measure, each of the passages chosen pre- and post- intervention were within the child's mechanical reading skill level as measured by the Burt Word Reading Test (Burt 1976). Thus, the below and above average readers were given different reading age passages and accompanying questions pre- and post- intervention (see Appendix 1b for test materials). It was felt that if the passages were too demanding on the child's decoding skills then their ability to apply metacomprehension strategies would be impaired, placing the poorer readers at a disadvantage and possibly introducing a confounding variable. Gavelek and Raphael (1985) have commented on this effect in relation to younger readers, noting that as younger readers mature, and their decoding skills become more automatic and therefore less cognitively demanding, more cognitive effort can be put to the integration of information, thereby improving comprehension.

Given the arguments noted above and outlined in Chapters 1 and 2, it was predicted that if the children were developing metacomprehension strategies from their curriculum then:

I. the children in the experimental group would show significant improvement in their ability to answer inferential questions as compared with the control group, and
II. the below average readers in the experimental group would show the greatest change in performance

## 4.5 Procedure.

All children participating in the study were assessed using the three measures outlined above. The tests were administered to the children in the same order (viz: 1. Question Generating, 2. Cloze test, 3. Comprehension test). The reason for maintaining this sequence was to avoid unintentional tutoring for the question generating measure which

might have occurred had the children been given the comprehension test first, the comprehension questions acting as exemplars for the QG measure. The pre-tests were administered to both the experimental and control groups four weeks into the school term and the post-tests six weeks later. The cloze test was administered by the class-teachers and the QG and comprehension tests were administered consecutively to each child by the researcher. The children were told that they were assisting the researcher in the assessment of new reading materials in an attempt to reduce the possible anxiety which may have occurred had they thought it was a test situation. The teachers involved in the study were asked to implement their normal language curriculum during the research phase. The experimental group were therefore using a novel study, and the control group a mainstream reading scheme. Each day the teacher read some of the novel to the whole class. She then discussed the content with the children by asking questions, re-capping on the previous readings and summarising the main ideas. After the class discussion the children were set a written comprehension exercise such as a cloze passage taken from the novel, or a list of questions about the story. Each written activity was completed individually. The graded reading scheme used by the control group provided similar opportunities for discussion and written comprehension exercises, but such work was determined by the children's mechanical reading skill level. Comprehension experiences provided by the graded reading scheme were therefore dictated by the child's level of reading attainment. The amount of time spent on teaching comprehension was the same for the experimental and control groups and determined by the 5-14 curriculum.

The teachers were not instructed as to the aim of the research. This was to ensure that the results would not be contaminated by increased knowledge, since the aim of the pilot study was to assess the status quo, that is, what was existing practice in relation to the teaching, or not, of metacomprehension? At the end of the research all teachers were briefed, thereby allowing some professional development.

## 4.6 Results : Scoring system used for each of the three measures

### *4.6.1 Cloze Test (Gap Reading Test).*

The guidelines and norms provided in the test manual were used to provide pre- and post-intervention reading ages which were then converted from years and months into months.

### *4.6.2 Question Generating (QG) Measure*

The data collected from the above were in the form of lists of questions for each child pre- and post- intervention. These were analysed according to the total number of questions generated and the type of question asked by each child in the pre- and post-intervention stages. The type of question generated was analysed using the 3 categories of question outlined by Pearson and Johnson (1978) (i.e., textually explicit, textually and scriptally implicit). The number of each of these three different forms of questions was recorded for each child. An independent judge (with knowledge of the curriculum for primary aged children) was asked to mark a random sample of 10 children's response sheets in order to check the reliability of the Experimenter's categorisation. A Kappa coefficient (Cohen 1960) was used as a means of determining the level of agreement between the two markers' categorisations. A Kappa coefficient of 1 indicates perfect agreement, and 0, no agreement. The Kappa coefficient computed for the above random sample of 10 scripts was 0.7 indicating an acceptable level of agreement between the markers' categorisation (Leach 1978).

### *4.6.3 Comprehension Measure*

Each child was given a score of 1 if their response to the question asked was correct. As there were 5 literal and 5 inferential questions each child had a mark out of 5 for each section and a composite mark out of 10. As with the QG measure the same independent judge was asked to mark a random sample of papers in order to check the degree of association between the two marker's scoring. A Pearson r was computed to provide a statistical measure of the above association and was found to be +0.72, indicating an acceptable level of correlation between the two markers' scores.

## 4.7 Analysis of Data

A pre- and post- test repeated measures design with control and experimental groups was used. Schools matched for socio-economic variables were randomly assigned to experimental and control conditions. Children in experimental and control conditions were then matched according to their Burt Word Reading score and assigned to the above and below average reading groups within the experimental and control schools. Randomised designs such as that described ensure that groups are equivalent thereby producing internal validity and allowing certain inferences to be made. Importantly, it can be assumed that any change in the dependent variable is due to the influence of the independent variable (Cook and Campbell 1979; Robson 1993). Parametric statistics which are essentially inference statistics and based on the above population assumptions were therefore used in the analysis of two of the three DV's (i.e., cloze and comprehension measures).

It was not felt to be appropriate to use parametric statistics for the question generating measure because of the distribution of scores which resulted when the number of questions were analysed and broken down into the three categories of questions. Although the data obtained from this procedure were still of a ratio form the distribution of the data did not conform to the normal parameters associated with the use of parametric statistics. Specifically, when the total number of questions generated were broken down into the three categories of questions (i.e., textually explicit and textually and scriptally implicit), the distribution could not be considered as linear and lacked homoscedasticity (equal variances; viz. Siegel 1956). In order to use an ANOVA (analysis of variance) statistical model it is assumed that the means of the population are linear, together with being normally distributed and of at least an interval scale of measurement. Given the non- linear nature of the data highlighted by the large number of zero scores observed in the raw data (Appendix 5) it was decided to use non-parametric statistics for the analysis of question type in the question generating measure. The use of ranks as deployed in non-parametric statistics matched more precisely the data obtained from this measure. In the conditions described, non-parametric statistics were considered as a more powerful statistical test (i.e., would have a high probability of rejecting

Ho when Ho was false, (Siegel 1956), than would have been achieved from an F test, in circumstances where the data so clearly lacked homogeneity (Kerlinger 1964).

The results for each measure were analysed separately and are reported below.

### *4.7.1 Cloze Test*

Table 1a provides a summary table of the means and standard deviations for the subjects' performance on the cloze test.

**Table 1a: Means and standard deviations for cloze test**

| Group | | pre | post |
|---|---|---|---|
| | | | |
| EA | Mean | 132.7 | 132.1 |
| | sd | *6.05* | *9.4* |
| EB | Mean | 115 | 119.7 |
| | sd | *13.1* | *12.3* |
| CA | Mean | 133.7 | 132.4 |
| | sd | *9.77* | *11.95* |
| CB | Mean | 107.3 | 114.7 |
| | sd | *7.5* | *57* |

**Key**
EA = Experimental above average readers: EB = Experimental below average readers
CA = Control above average readers: CB = Control below average readers
***Means and standard deviations are in months***

The maximum score obtainable on the test was 144 months (12 years). It was hypothesised that in order to perform well in cloze tests, subjects' would need to deploy metacomprehension strategies. It was also expected, that the below average groups would benefit more from training in metacomprehension, and that the children being taught using a novel study

(i.e.,experimental group) would be better than those children not being taught using a novel study. An inspection of the pre-test data shows that the above average groups scored well above their chronological ages (mean CA =110 months) as compared with the below average groups, and there appears to be little change in performance post- intervention for the above average readers.

To test the above observations for significance a 2x2x2 (Experimental* Control X Above average readers*Below average readers X Pre test*Post test) ANOVA was computed with repeated measures on one factor (i.e., Pre- and Post- test); the results of which are summarised in Table 1b.

**Table 1b: Summary ANOVA table for cloze test measure**

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| Between Ss | | | | | |
| E/C | 1 | 192.667 | 192.667 | 1.277 | ns |
| A/B | 1 | 8251.042 | 8251.042 | 54.676 | <0.001 |
| E/C*A/B | 1 | 294 | 294 | 1.948 | ns |
| sub. within gp | 44 | 6639.917 | 150.907 | | |
| | | | | | |
| Within Ss | | | | | |
| Pre/Post | 1 | 155.042 | 155.042 | 3.581 | ns |
| E/C*pre/post | 1 | 6 | 6 | 0.139 | ns |
| A/B*pre/post | 1 | 287.042 | 287.042 | 6.629 | <0.05 |
| E/C*A/B*pre/post | 1 | 16.667 | 16.667 | 0.385 | ns |
| A/B*Ss within Gp | 44 | 190.25 | 43.301 | | |
| Total | 17747.62 | | | | |

**Key:** E=Experimental group: C=Control group

A=Above average readers: B=Below average readers

Pre=Pre-test: Post=Post-test

Two significant results were obtained; a main effect for above and below average readers ($p<0.001$; $F(1,59) = 54.676$) and a within subject

interaction between the above and below average readers pre- and post-test ($p<0.05$; $F(1,59)=0.385$)). A related t-test demonstrated that the significant result obtained from the interaction was due to the greater change in performance by the below average readers ($p<0.05$) as compared with that of the above average readers ($p>0.05$) regardless of condition (i.e., whether they were in the experimental or control group).

### *4.7.2 Comprehension Measure*

The subjects were asked pre- and post-intervention to answer 5 literal and 5 inferential questions about a passage they had just read. They were given a score of 1 for each question answered correctly. The maximum score obtainable was 10. An analysis of the raw data revealed that 8.2% of the subjects scored the maximum of 10 in the pre-test condition and 10% of the subjects scored 10 in the post test condition.

Two mean and standard deviation summary tables are provided. Table 2a, describes the children's mean scores for literal and inferential questions combined.

**Table 2a: Means and standard deviations for comprehension measure combining literal and inferential questions.**

| Group | | pre | post |
|---|---|---|---|
| | | | |
| EA | Mean | 7.07 | 7.9 |
| | sd | *2.3* | *1.1* |
| EB | Mean | 7.5 | 7.5 |
| | sd | *1.5* | *1.8* |
| CA | Mean | 7.07 | 8.1 |
| | sd | *2.2* | *1.1* |
| CB | Mean | 7.8 | 8.6 |
| | sd | *2.2* | *1.3* |

**Key:**

**EA** = Experimental above average readers : **EB** = Experimental below average readers
**CA** = Control above average readers: **CB** = Control below average readers

Table 2b describes the children's mean scores and standard deviations, pre- and post-test for each of the two different question categories; literal and inferential. The maximum score possible was 5 for the literal category, and 5 for the inferential category.

**Table 2b: Means and standard deviations for comprehension measure with questions divided into literal and inferential categories.**

| | | Pre-test | | Post-test | |
|---|---|---|---|---|---|
| | | Literal | Inferential | Literal | Inferential |
| EA | X | 4.4 | 2.8 | 4.4 | 3.5 |
| | sd | *1.1* | *1.4* | *0.5* | *0.7* |
| EB | X | 4.1 | 3.4 | 4.4 | 3.1 |
| | sd | *0.7* | *1.3* | *1* | *1.2* |
| CA | X | 4.1 | 3.1 | 4.5 | 3.5 |
| | sd | *1* | *1.2* | *0.5* | *1.05* |
| CB | X | 4.3 | 3.5 | 4.5 | 4.1 |
| | sd | *1* | *1.2* | *1* | *0.7* |

**Key**: **EA** = Experimental above average readers: **EB** = Experimental below average readers
**CA** = Control above average readers: **CB** = Control below average readers
**X**= Mean

From Table 2a it can be seen that all children (except those in the experimental below average group whose mean score remained unchanged) improved post- intervention, i.e., they answered more questions correctly. From Table 2b, where the data are sub-divided into the

two different question categories, it would appear that all of the children answered correctly more literal than inferential questions.

The above observations were tested for statistical significance using a 2x2x2x2 (Experimental*Control X Above*Below average readers X Literal*Inferential questions X Pre*Post intervention) ANOVA, with repeated measures on one factor (ie. Pre/Post test ). Significant results are in bold type and numbered in Table 2c.

**Table 2c: ANOVA table for comprehension measure**

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| A/B | 1 | 1.0562 | 1.0562 | 0.66 | 0.41 |
| E/C | 1 | 0.1563 | 0.1563 | 0.1 | 0.756 |
| L/I | 1 | 41.0062 | 4.1e+1 | 82.82 | 0.000 (i) |
| Pre/Post | 1 | 2.7562 | 2.7562 | 2.42 | 0.128 |
| sub(A/B, E/C) | 36 | 57.325 | 1.5924 | no exact F | |
| A/B*E/C | 1 | 3.3063 | 3.3063 | 2.08 | 0.158 |
| A/B*L/I | 1 | 1.8062 | 1.8062 | 3.65 | 0.064 |
| A/B*Pre/Post | 1 | 0.5063 | 0.5063 | 0.45 | 0.509 |
| E/C*L/I | 1 | 1.0562 | 1.0562 | 2.13 | 0.153 |
| E/C*Pre/Post | 1 | 2.2562 | 2.2562 | 1.98 | 0.167 |
| L/I*Pre/Post | 1 | 0.1563 | 0.1563 | 0.26 | 0.613 |
| L/I*sub(A/B E/C) | 36 | 17.825 | 0.4951 | 0.82 | 0.717 |
| Pre/Post*sub(A/B E/C) | 36 | 40.925 | 1.1368 | 1.89 | 0.030 (ii) |
| A/B*E/C*L/I | 1 | 0.0562 | 0.0562 | 0.11 | 0.738 |
| A/B*E/C*Pre/Post | 1 | 0.3063 | 0.3063 | 0.27 | 0.607 |
| A/B*L/I*Pre/Post | 1 | 0.1563 | 0.1563 | 0.26 | 0.613 |
| E/C*L/I*Pre/Post | 1 | 0.0562 | 0.0562 | 0.09 | 0.761 |
| A/B*E/C*L/I*Pre/Post | 1 | 2.7562 | 2.7562 | 4.59 | 0.039 |
| Error | 36 | 21.625 | 0.6007 | | |
| Total | 159 | 195.093 | | | |

**Key:** **E**=Experimental group: **C**=Control group
**A**=Above average readers: **B**=Below average readers
**L**=Textually explicit questions: **I**= Textually implicit questions
**Pre**=Pre-test: **Post**=Post-test

It can be seen from table 2c (see **I**) that there was a significant difference ($p < 0.001$; $F(1,59)=82$) in children's ability to answer literal and inferential questions irrespective of condition or reading skill level (whether it was the experimental or control group, or above or below average readers ).

Children were therefore better at answering literal than inferential questions and did not significantly improve their performance on either category of question after teaching. The second significant effect (**II**) is a subject factor and like group factors is included within the statistical package as a "formal necessity" (Lee **19??**). It is therefore of little interpretive use since it is an artefact of repeated measures block designs such as that deployed in the present study.

### *4.7.3 Question Generating Measure.*

The children were asked to read a passage and then to pretend to be the teacher and ask the experimenter questions related to the story. A record was made of the total number of questions asked, together with the number of questions generated under each of the following three categories: textually explicit (literal form), textually implicit and scriptally implicit (inferential forms). A cursory inspection of the data demonstrates that 7 of the 60 children in the sample were unable to generate questions in the pre-test situation and this improved marginally to 3 of the 60 children.

Table 3a over leaf provides the means and standard deviations for the total number of questions generated and Table 3b provides means and standard deviations for each of the three categories of questions.

**Table 3a: Means and standard deviations for total number of questions generated.**

| Group | | pre | post |
|---|---|---|---|
| EA | Mean | 9.6 | 9.5 |
| | sd | *6.6* | *9.4* |
| EB | Mean | 7.1 | 7.7 |
| | sd | *6.8* | *5.7* |
| CA | Mean | 8.8 | 9.6 |
| | sd | *7* | *5.9* |
| CB | Mean | 5.5 | 5.4 |
| | sd | *3.5* | *3.4* |

**Key:** EA = Exp't above average readers EB = Exp't below average readers
CA = Control above average readers: CB = Control below average readers

**Table 3b: Means and standard deviations for question generating measure for each of the three question categories.**

| | | Pre-test | | Post-test | | | |
|---|---|---|---|---|---|---|---|
| | | L | I | S | L | I | S |
| EA | Mean | 7 | 1.1 | 1.1 | 7.1 | 1.1 | 1.2 |
| | sd | 5.8 | 1 | 1.8 | 8.5 | 1.1 | 2.3 |
| EB | Mean | 6.7 | 0.9 | 0.5 | 6.4 | 1 | 0.3 |
| | sd | 6.5 | 1.4 | 1.7 | 5.6 | 1.7 | 0.9 |
| CA | Mean | 7 | 0.8 | 7.6 | 7.6 | 1.2 | 0.2 |
| | sd | 5.5 | 0.8 | 4.9 | 4.9 | 0.9 | 0.77 |
| CB | Mean | 5.2 | 0.2 | 3.8 | 3.8 | 1.1 | 0.3 |
| | sd | 5.5 | 0.4 | 2.8 | 2.8 | 1 | 0.6 |

**Key:** EA = experimental above average: EB = experimental below average CA = Control above average: CB = control below average L= textually explicit: I= textually implicit: S= scriptally implicit

The data were investigated in the first instance to ascertain whether there were any significant differences between treatment groups pre- and post-intervention in the total number of questions generated. A 2x2 ANOVA was computed with repeated measures on one factor (pre- and post-intervention). From Table 3c it can be seen that there were no significant differences in the number of questions asked within or between groups.

**Table 3c: Summary ANOVA table for question generating measure using the total number of questions asked.**

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| Between Ss | | | | | |
| E/C | 1 | 26.45 | 26.45 | 0.401 | ns |
| A/B | 1 | 174.05 | 174.05 | 2.639 | ns |
| E/C*A/B | 1 | 12.8 | 12.8 | 0.194 | ns |
| sub. within gp | 36 | 2373.9 | 65.942 | | |
| | | | | | |
| Within Ss | | | | | |
| Pre/Post | 1 | 1.8 | 1.8 | 0.126 | ns |
| E/C*pre/post | 1 | 0.05 | 0.05 | 0.003 | ns |
| A/B*pre/post | 1 | 0.05 | 0.05 | 0.003 | ns |
| E/C*A/B*pre/post | 1 | 3.2 | 3.2 | 0.224 | ns |
| A/BxSs within Gp | 36 | 514.9 | 14.303 | | |
| Total | 39 | 3107.2 | | | |

**Key:** **E**=Experimental group: **C**=Control group
**A**=Above average readers: **B**=Below average readers
**Pre**=Pre-test: **Post**=Post-test

As indicated previously, the type of data obtained when subdivided into the three categories of textually explicit, textually implicit and scriptally implicit questions were not felt to meet the criteria normally expected for the use of parametric statistics and were therefore analysed using non-parametric statistics. A series of Wilcoxon tests were used to determine whether there were any within group differences for each of the three categories of questions, pre- and post- intervention. Table 4 demonstrates that there

were significant differences for all those comparisons involving textually explicit questions i.e., children would appear to ask significantly more textually explicit questions than they do textually or scriptally implicit questions. There was one anomaly to this (see I xS) for the above average control group, post intervention, where $p<0.05$.

## Table 4: Wilcoxon results for within group differences comparing question categories

| | | Pre-test | | | Post test | | |
|---|---|---|---|---|---|---|---|
| | | TT | TO | p | TT | TO | p |
| EA | LxI | 13 | 11.5 | 0.01 | 16 | 15.5 | 0.01 |
| | LxS | 13 | 12 | 0.02 | 11 | 7.5 | 0.05 |
| | IxS | 6 | 28.5 | ns | 17 | 41 | ns |
| EB | LxI | 4 | 4 | 0.05 | 6 | 5 | 0.05 |
| | LxS | 10 | 4..5 | 0.01 | 2 | 2 | 0.01 |
| | IxS | - | - | ns | - | - | ns |
| CA | LxI | 7 | 0 | 0.01 | 13 | 5 | 0.05 |
| | LxS | 13 | 5.5 | 0.01 | 16 | 3.5 | 0.01 |
| | IxS | 11 | 56 | ns | 17 | 14 | *0.05 |
| CB | LxI | 5 | 0 | 0.01 | 6 | 5 | 0.05 |
| | LxS | 7 | 2 | 0.01 | 7 | 6 | 0.01 |
| | IxS | 12 | | ns | 8 | 13 | ns |

**Key** **EA** = exp't above average **EB** = exp't below average **CA** = Control above average **CB** = control below average **L**= textually explicit: **I**= textually implicit: **S**= scriptally implicit **TT** = tabled T: **TO** = Observed T

The apparent anomaly detailed in Table 4 (i.e., the significant IxS (textually implicit vs scriptally implicit) result for the above average control group) may be explained by Table 5 which looks at differences within question categories pre- and post- intervention, again using a series of Wilcoxon tests. It would be expected that if children were benefiting from metacomprehension training as hypothesised in relation to the experimental group, then the experimental children should be able to formulate significantly more of each category of question post intervention, but in particular, more textually and scriptally implicit questions. It was also hypothesised that such changes should be greater for the below average readers. From Table 5 it can be seen that this was not the case for either the above or below average experimental group readers.

A significant pre/post intervention result was found for the above average control group in the number of scriptally implicit questions asked ($p < 0.05$). An investigation of the data demonstrates that this arose because of the children's poorer performance post- intervention i.e., they generated significantly fewer scriptally implicit questions. However, given the very small numbers of scriptally implicit questions generated pre- and post- test, any meaningful statistical analysis of such data is questionable.

## Table 5: Wilcoxon pre- and post- within group differences for question generating measure

| | | | |
|---|---|---|---|
| | L pre x | I pre x | S pre x |
| | L post | I post | S post |
| EA | TT = 17 | TT = 6 | TT = 4 |
| | TO = 47.5 | TO = 52.5 | TO = 50 |
| p | ns | ns | ns |
| EB | TT = 5 | - | - |
| | TO = 21 | - | - |
| p | ns | - | - |
| CA | TT = 2 | TT = 4 | TT = 0 |
| | TO = 54 | TO = 51 | TO = 0 |
| | ns | ns | p<0.02 |
| CB | TT = 8 | TT = 4 | - |
| | TO = 22.5 | TO = 2 | - |
| p | ns | ns | - |

**Key**

**EA** = exp't above average

**EB** = exp't below average

**CA** = Control above average
**CB** = control below average
**L**= textually explicit:**I**= textually implicit: **S**= scriptally implicit
**TT** = tabled T: **TO** = Observed T

**-** = no data available due to small numbers of questions generated in these categories
**p**=probability

The pilot study was concerned with whether or not there were any differences between the experimental and control conditions in the category of questions generated. It was hypothesised that if metacomprehension strategies were being taught, then this should be indicated by an increase in textually and scriptally implicit questions. If as suggested the novel is a more sympathetic vehicle than a mainstream reading scheme for developing metacomprehension strategies, then it would be expected that the experimental groups of children would generate significantly more textually and scriptally implicit questions post intervention. Also, given the research evidence in relation to the differential effect of metacomprehension instruction for good and poor readers, it would be expected that the poor readers would demonstrate a greater change in performance than the good readers. The interesting comparisons are

therefore the between group differences i.e., the differences between the control above and below average readers, and the experimental above and below average readers in the post-test condition. When the data were analysed for between group differences pre- and post- intervention using a series of Mann-Whitney U tests (corrected for ties) the only significant results were found for the pre- intervention stage (see Table 6). Such results would be expected given the matching of subjects (i.e., the good readers would be expected to out perform the poor readers irrespective of condition).

**Table 6: Mann-Whitney U test of significance for independent groups, pre- and post- intervention**

| Comparison | Pre-test | | |
|---|---|---|---|
| | U | z | p |
| EAS * CBS | 55 | -1.958 | p<0.05 |
| CAI * CBI | 53.5 | -2.027 | p<0.05 |
| EAI*CBI | 46 | -2.372 | p<0.05 |

**Key:**

E= exp't group: C = Control group: A=above average readers: B= below average readers

L= textually explicit:I= textually implicit: S= scriptally implicit

## 4.8 Discussion

The main aim of the pilot study was to discover whether or not children were already learning metacomprehension strategies. More specifically, by comparing two extant teaching methods, standard reading schemes and the use of the novel, the pilot study aimed to discover whether children learning with the later method demonstrated better metacomprehension strategies. In addition, the study was concerned with whether there were differential effects in metacomprehension skill development between good

and poor readers. Using a pre- and post- test design, it was predicted that children in the experimental group (i.e., those being taught using a novel) would significantly improve their performance on the three metacomprehension measures as compared with those children in the control group, and that within each treatment condition, the below average readers would demonstrate the greater change in performance.
The results demonstrate that there were no significant treatment effects found on any of the three measures of metacomprehension ability irrespective of teaching method deployed. Children's ability to perform in a cloze test, and to answer and to ask literal (textually explicit ) or inferential (textually implicit and scriptally implicit) questions did not appear to be significantly improved by the use or non use of a novel study. It could be argued that teachers were not deploying novel studies in a way which adequately exploited the strengths of the medium: such an argument assumes that novels can provide mediated learning opportunities for children and that through discussion and dialogue with the class teacher and peers, children will begin to assume a more proactive role in the learning experience. Given the results it would appear that:
i) mediated learning experiences were not being provided by the use of a novel,
or
ii) other methods are as ineffective in providing such experiences and therefore no significant differences were found between the two conditions,
or
iii) children are not being taught metacomprehension skills, irrespective of teaching methodology, resulting in the lack of within subject pre- and post - test differences.

It may be concluded that current practice as reflected by the two conditions investigated in the pilot study does not seem to help children's metacomprehension development.

The following looks at the results more closely, investigating each measure separately, and discussing the possible implications arising from the data.

### *4.8.1 Cloze test*

On the cloze test one would expect the subjects' standardised scores to significantly increase as they became more able to make educated guesses about which words might come next in a sentence, thereby allowing them to fill in more of the missing words in the short stories constituting the test. Such a skill depends on the child instigating appropriate remedial strategies which depend on the child having developed metacomprehension awareness and strategies. In the context of the cloze test appropriate strategies would be to:

i) read onto the end of the sentence or

ii) re-read the preceding sentence(s)

iii) determine what the most likely grammatical form would be (noun, verb, preposition etc)

iv) try alternative words and read for meaning (i.e., to pose the question: "does this make sense on syntactic and semantic levels"?).

The results in the cloze test showed significant changes for the below average pupils, irrespective of the treatment condition: the poorer readers showed a larger improvement than the abler readers after the six week research period. In fact the above average readers showed virtually no change irrespective of the treatment condition (means for EA = 132.7 pre-intervention and 132.1 post- intervention; means for CA = 133.7 pre-intervention and 132.4 post- intervention).

There are a number of possible explanations for this result. If we accept the above rationale for using the cloze measure, it would indicate that the below average readers had developed better metacomprehension skills over the research phase. Such development was not influenced by the teaching methodology applied, since there was no significant difference between the experimental and control groups. It must be assumed, therefore, that improvements were due to some other factor, possibly, other teaching procedure(s) occurring within the class-room. Observation of class-room practice together with reports from class teachers would indicate that cloze procedure is a common assessment tool applied within primary schools. In comparison with the other measures the procedure would have been familiar to the children, and it is likely that the teacher would

previously have given them some instruction on how to approach this particular task, so frequent opportunities for practice and instruction would have been given to the children. It may be asked why this earlier instruction did not help to improve the children's performance on the other two measures of metacomprehension (the comprehension and QG measures). The assumption here is that if children have developed metacomprehension skills then they should be able to use these in other similar comprehension activities.

The fact that such teaching did not improve the children's performance on the other measures may suggest that the teacher did not explicitly state the function and uses of the strategies she was teaching whilst using cloze procedure, thereby preventing children from internalising the strategies which would have enabled them to generalise the knowledge and techniques to other comprehension activities. It has been indicated by other researchers in the area (Brown 1982), that one of the important features of metacomprehension training is the explicitness to the children of the instruction programme. Direct instruction allows the child to develop knowledge about cloze procedure. They therefore learn about the demands of the task (that cloze procedure consists of making educated guesses about which words make sense in a sentence) and how to apply remedial strategies (as detailed above). They then progress onto knowing when and why to apply the strategies. Paris and Cross (1984) referred to these different aspects of metacomprehension knowledge as the declarative (knowing that), procedural (knowing how) and conditional (knowing when and why and appreciating the value of cognitive strategies) components. The conditional knowledge which children have about the task is the most important if they are to become self-directed and independent readers. If the children were not taught with the express intention of developing metacomprehension skills, then it is unlikely that the teacher will have covered all three aspects of metacomprehension knowledge. At best the children will have been taught how to perform cloze procedure and practice in doing this type of exercise could only be expected to help them with this specific task. They require the "when" and "why" aspects in order to transfer the skills to other tasks. The conditional knowledge therefore only provides children with an appreciation of the

underlying rationale for using the strategies they are being taught.

An alternative explanation for the apparent lack of generalisation to the other two measures of metacomprehension (the comprehension and QG measures) may be that there are no discrete and unified "metacognitive skills" (as proposed by Thorpe and Satterly 1990), and that training children to use metacomprehension strategies is therefore context specific and non-transferable. There may then be different kinds of metacomprehension skills and knowledge required for different types of comprehension activities. Such an argument is not borne out by the results from other metacomprehension training studies (e.g., Palincsar and Brown 1984) which have demonstrated generalisation of metacomprehension training across different comprehension tasks.

It seems more likely that the reason for the children's relative failure to generalise their performance on the cloze test to the other two measures of metacomprehension, was the lack of direct instruction by the class teacher of the declarative, procedural and conditional components of the strategies used in cloze procedure. The children may not have learned any metacomprehension skills, but simply how to perform on a cloze test.

A further point of interest is the finding that only the below average readers showed significant improvement in the Gap test. It has already been argued that, whilst the teacher was likely to have provided many opportunities for children to use cloze procedure, any instruction was likely to be at an incidental level, and explicit training in metacomprehension skills covering the declarative, procedural and conditional components was unlikely to have been tackled. It was also noted in the introduction that it is more important for poor readers than good readers to receive direct instruction on metacomprehension skills, to allow them to use these strategies effectively in comprehension activities (e.g., Chall and Squire 1991; Malone and Mastropieri 1992). If no direct training was given by the teacher, then it cannot be argued that the below average readers benefited more than the above average readers because of the differential effects of teacher instruction. The differential effect is more likely to be due to a ceiling effect experienced by the above average subjects. By looking at the

table of means ( table 1a), it can be seen that in the pre-test condition the above average readers were scoring at the top end of the norms (e.g., mean score pre-test for experimental above average = 132.7mths; top score for test = 144mths). Change in performance over the research phase was therefore considerably restricted for this group. For example, of the 30 children in the good reading group, 5 were at the top of the norms pre intervention. These children may have improved post intervention but the test would have been unable to measure such change. The apparent difference between the good and poor readers may therefore reflect the inadequacy of the dependent variable (i.e., the Gap test), as a measure of change than any real difference.

An alternative explanation may be that the above average readers were already applying metacomprehension strategies prior to the research phase. The very fact that they were better at cloze procedure is perhaps indicative of their superior metacomprehension knowledge and awareness. After all, the reason for using cloze procedure as a dependent variable was because performance on such a test was regarded as being reliant on metacomprehension strategies. Good performance on such a test may therefore indicate already well developed metacomprehension awareness. At best, any metacomprehension instruction might only have been expected to further refine their skills and as such may not have been detectable by the Gap test. At worst, training may have been detrimental to performance, interfering with existing strategies, possibly causing conflict. This point is commented upon by Brown and Palincsar (1984) who noted that the same training in metacomprehension strategies for good and poor readers is not always appropriate; if children are independently applying 'meta' strategies in their reading, then further training is redundant, and at worst detrimental. In such circumstances one might expect a deterioration in performance post intervention. A small but insignificant decrease was observed (mean pre-test= 133.2: mean post-test = 132.3), which could be accounted for by the test-retest variance.

Many explanations have been proffered to explain the significant pre and post test difference found between good and poor readers on the cloze test. Such a difference was found simply as a result of teaching, it did not matter

about the form of teaching (i.e., whether a novel was used or not). In this context, together with the fact that the cloze test was only significant when subjects were collapsed across conditions, the balance of evidence would suggest that the significant change in performance by the poor readers as compared with the good readers was due to the ceiling effect experienced by the good readers. The ability of the test to measure change was therefore severely restricted for the above average children, some of whom were at the top of the norms pre- intervention.

By implementing a metacomprehension teaching programme with direct instruction of metacomprehension strategies, and by using an alternative cloze test with a higher ceiling such as that provided by the Gapadol (McLeod and Anderson 1973), it may be possible to assess the validity of the above hypotheses.

### *4.8.2 Comprehension measure*

It was expected that on the comprehension measure children would be better at answering literal than inferential questions, and that any improvement due to the development of metacomprehension strategies would be greater for inferential than literal questions. It was assumed that the answering of literal questions was not as dependent on metacomprehension because the answers are more obvious requiring less interpretation, and so are less likely to require the reader to activate metacomprehension strategies. The answering of literal questions might be compared to a person walking down the stairs, a skill requiring little thinking, until something occurs to make this slightly different, for example, uneven steps, at which point it becomes necessary for the person to monitor and think about the behaviour. Using the above metaphor, in normal circumstances literal questions would be analogous to the even steps, whilst the answering of inferential questions would be equivalent to the uneven steps requiring the reader to monitor, reflect and activate adaptive reading behaviours (i.e., metacomprehension strategies).

For the reasons outlined here and in the introduction, if children were being taught metacomprehension strategies by the teacher then it would be expected that their performance on the inferential questions would improve

significantly as a result of teaching. Thus, there would be a significant difference in the number of inferential questions answered correctly after, as compared with before teaching. Changes in the children's abilities to answer literal questions was expected to remain relatively unchanged since these are not as dependent on metacomprehension.

The results from the comprehension measure demonstrated that children were better at answering literal than inferential questions. There was no difference in their performance as a result of teaching, they started off better at answering literal questions and remained better at answering this type of question irrespective of which teaching method was used, or whether they were good or poor readers. This result is in agreement with other similar studies (Hanson and Pearson 1983) which have demonstrated that prior to metacomprehension training, readers were better at answering literal as compared with inferential questions. Unlike the results obtained by Hanson and Pearson (1983), the children's ability to answer inferential questions did not significantly improve post intervention. This was the case for both the experimental and control groups, and the above and below average readers. It is possible that the children's apparent failure to improve their inferential answering skills was due to the absence, or poor delivery of, metacomprehension teaching. Support for this position is given by the positive gains in inferential answering skills obtained by the children in Hanson and Pearson's (1983) study which exposed the children to an instructional programme aimed at improving inferential comprehension. The implication being, that if metacomprehension training is an explicit aim of instruction, then children can improve their understanding at an inferential level.

An alternative explanation for the lack of significant change in children's inferential question answering performance might be found in the construction of the test. An inspection of the pre-test data reveals a 50% accuracy rate for both literal and inferential questions (going as high as 88% accuracy for literal questions, and 70% for inferential questions). The fact that the test yielded such high initial comprehension scores may have limited its effectiveness in detecting change. The test should perhaps be designed to force errors, producing a higher initial failure rate. This could

be achieved either by choosing harder questions and/or different passages from which the questions were derived

### *4.8.3. Question Generating*

In addition to answering questions, the children were also asked to generate their own questions about a text. They were asked to read a short story and then to pretend to be the teacher and ask questions about the text. Observations of class room practice (and comments from teachers such as "Oh, I'd be surprised if they can ask you questions, because it's not something we've covered") would suggest that this was an unusual activity for the children and no direct instruction of the strategy would have been given by the teacher. It might be assumed then, that performance on the QG measure was dependent on incidental learning experiences; the children intuitively modelling themselves on the examples of question asking provided by the teacher during an oral comprehension exercise.

Despite the lack of direct teaching only 7 of the children in the pre-test condition and 3 in the post-test condition, were unable to formulate questions. The average number of questions asked ranged from 9.6 (experimental above average pre-test) to 5.5 (control below average pre-test). No significant pre and post test differences were found and there were no differences between the experimental and control groups or for above or below average readers. Despite the lack of significant differences, it was encouraging that the children were able to pose questions, indicating that whilst this skill may not be highly developed (at least to produce statistical significance), it could perhaps be developed through teaching, into a useful metacomprehension strategy enabling children to use self-generated questions to monitor their understanding of narrative texts. The assumption being made is that, if children can pose questions whilst reading, then in looking for the correct response, they are forced into evaluating their understanding of the text. In the process of posing and answering a self-generated question the reader is provided with insight into their own failures of understanding which then allows them to take remedial action such as re-reading the sentence, paragraph or word, and/or focusing on specific sections of text relevant to the question being posed.

Being able to pose a question about something one is reading is a useful skill. However, the type of question one asks is also important since this will influence the level of analysis required to answer it, and thereby, the depth of understanding ultimately achieved. If one wanted to be able to read between the lines, for instance, go beyond what is obvious within the text and make predictions, judgments and evaluations, then it would be necessary to pose questions which would lead to an inferential analysis of the text. It was argued that the type of question posed by children would provide information about their level of thinking about a text. Three categories of questions were investigated, textually explicit (literal), textually implicit and scriptally implicit (inferential), each requiring an increasing level of metacomprehension knowledge and awareness. It was found that the children were all significantly better at posing textually explicit questions. Thus, the majority of the questions asked by the children would have involved them in a literal analysis of the text. This concurs with the sample's performance in the comprehension test, where they were found to be better at answering literal (textually explicit) questions. It would appear that the children were better at answering and asking textually explicit questions.

One might speculate, that if the children had generated more inferential questions then this would have been reflected in their ability to answer inferential questions: But which skill comes first, to ask or answer a question, or is one dependent on the other? Both skills demand the application of metacomprehension knowledge and to this extent are related, however it would be interesting to see if by teaching children how, why and when to apply question generating strategies, their performance in answering inferential questions improved. Conversely, if children are taught metacomprehension strategies in how to answer questions, do they become better at posing questions. If metacomprehension skills are transferable then one would expect some improvement from training in one or other of the two related measures. In the present pilot study there is no evidence that children were directly taught how to answer questions or generate their own question/answer strategies. Personal observations of classroom teaching practice, together with the empirical evidence provided by Durkin's (1978-79; 1981; 1986) and Duffy's (1986) work would lead one to hypothesise that children's ability to ask and answer literal questions,

results from the incidental learning derived from teacher modelling and the emphasis of textbooks on literal comprehension instruction. Conversely, their inability to answer and ask inferential questions was probably due to a lack of direct teaching. For children to develop an understanding of the demands placed on the reader to answer inferential questions, they would have to be taught what an inferential question was, how to go about finding the relevant information in the text, and when and why to apply such declarative and procedural knowledge. There is no evidence that the children in the pilot study were provided with such experiences, and it is doubtful if the teachers' were aware of the importance of teaching declarative, procedural and conditional knowledge.

### *4.8.4 Summary*

The results from the three measures of metacomprehension, seem to suggest that children are not being taught metacomprehension strategies, and that this is the case for children being taught using novel studies and for those exposed to more traditional methods (e.g., mainstream reading schemes). The children's performance on each of the measures did not significantly improve as a result of teaching. It is argued that this was probably due to a lack of overt instruction designed to teach children metacomprehension strategies. To achieve this goal children would have to be taught explicitly the declarative, procedural and conditional aspects of comprehension. By knowing that, how and why certain activities can be used to aid comprehension, the children would have been in a better position to direct their own learning, thereby becoming independent learners. For teachers to incorporate such a programme, they themselves would have to be aware of the importance of developing metacomprehension strategies. Observations of classroom teaching would indicate that teachers are involved in oral discussion with their pupils, they provide good questioning models, but fail to explain their own thinking behind the examples they provide for their pupils. In a good reading and language session a series of written inferential questions may be given to pupils after the teacher has discussed the text, and although inferential oral discussion will probably have taken place, the teacher is unlikely to have demonstrated to the children how to go about finding the relevant information in a text to answer an inferential question. In fact it is unlikely

that the children have been told that there are different types of questions that require a different amount of analysis and synthesis to produce an appropriate response, and that some questions require answers which are dependent on their imagination and previous experience. In a metacomprehension teaching session the child would be told **that** there are different types of question, shown **how** to look for the information to answer an inferential question, given examples of **what** kind of questions to ask themselves whilst reading as a means of determining whether or not they are following the text, and given an explanation as to **why** such strategies and information are important. Additionally, they would be encouraged to monitor their reading so as to know when to stop and form a question. Forming a question is in itself a self-monitoring strategy, but overlaying such behaviour is an on-going regulatory process, assisting in the production of question generating. Existing practice assumes incidental learning of the above strategies, however such an assumption would seem to be limiting especially for young and poor readers. In the review of the literature it was noted that young and poor readers have limited metacomprehension awareness and that their comprehension abilities are deficient as a result (e.g., Paris and Jacobs 1984). To remediate such problems, direct metacomprehension instruction was found to be effective for both young and older readers. Unfortunately, the present study suggests that such instruction is not occurring and what appears to be happening is that children bring to the task of reading what they have already gained through maturation. Thus, they can answer and ask literal questions before teaching, and again after teaching. Exposure to good examples of inferential question asking by the teacher does not significantly help them to answer such questions, or use the skill to self -interrogate (Brown, Armbruster and Baker 1986). Such a situation resembles that described by Tizard (1978) in relation to structured versus free play. In their discussion of pre-school children's play they found that exposing children to well organised curricula experiences through the deployment of relevant play materials, did not necessarily progress children's learning. Instead, the children played with the material using the skills which they had already learned. To further their development, the children needed adult guidance and direction. In effect they required explicit instruction achieved through interaction around a relevant task. It might be argued that the same

principles apply to the teaching and learning of reading comprehension.

The novel could provide a sympathetic medium for incorporating a metacomprehension programme. It is more likely to motivate children as compared with normal reading schemes and it would involve the teacher and pupil in a dialogue aimed at achieving a shared body of knowledge. During the process involved in reaching a state of shared knowledge and understanding the teacher should have been afforded opportunities for discussing with the children the thinking skills involved in achieving meaning. In this way the novel provides opportunities for "mediated learning" (Feuerstein 1980): the novel possibly being the mediator in the process of learning to become a self-directed and strategic reader.

It is likely that the medium for teaching metacomprehension skills is not as important a deciding factor in whether children develop metacomprehension skills, as is the explicitness and content of the teaching programme. The novel study could therefore, be used as a vehicle for teaching metacomprehension strategies, but the success or failure of the programme will probably depend on the instructional content than the medium for introducing it.

## 4.9 Conclusions

It was noted in the introduction to the pilot study that the motivation for the present research was based on the premise that metacomprehension strategies are not currently taught to children, and that to enable such instruction to be incorporated into the curriculum, children and teachers would need to have this as an explicit aim. It was also suggested that the novel may provide a sympathetic medium for introducing metacomprehension strategies. The pilot study was therefore designed to establish:

i) if metacomprehension strategies were presently being taught in the mainstream classroom

ii) if the use of a novel was more likely to achieve gains in metacomprehension as compared with a mainstream reading scheme

iii) if there was a difference between good and poor readers in their metacomprehension attainment.

It was also used as a testing ground for the assessment tools (i.e., the dependent variables) designed to measure metacomprehension. The results indicate that children are not being taught metacomprehension strategies. It was suggested that the content of teaching may be the significant factor in determining whether children achieve metacomprehension strategies, than the medium used. In practice, the content and teaching methodology are likely to interact with one another to produce an effect. Thus, for the reasons stated in Chapter 3 the novel may be a sympathetic medium, but is not sufficient in itself to facilitate children's metacomprehension development. Such an outcome might be expected given the research evidence which emphasises the need for overt instructional programmes which make explicit the underlying thinking processes involved in reading for meaning.

Given that there were no significant main effects, it is not surprising that no clear differences were obtained for good and poor readers. In discussing the results for good and poor readers it was noted that two of the dependent variables may have been insensitive to small changes in performance. The norms for the cloze test were calibrated such that they did not provide a high enough ceiling for the good reading group. Similarly the comprehension test did not force sufficient errors, exemplified by the fact that both good and poor readers achieved high accuracy results pre-intervention. Given the possible difficulties of interpretation experienced by the insensitivity of the measures used, it would be necessary in future research to modify the test materials to avoid the ceiling effects experienced in the pilot study.

It would appear that current practice does not seem to assist in children's metacomprehension development. It is likely that, to teach children metacomprehension strategies, teachers must incorporate some direct instruction of metacomprehension strategies. They must teach children to be metacognitive: "*What is most important (*in relation to developing children's comprehension[1] *), is for educators to realise that* ***action*** *must be taken to help children acquire effective metacognitive strategies*" (Kendal and Mason 1982).

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[1] authors insert

# Chapter 5: A metacomprehension approach to teaching reading comprehension - Mr. Homunculus the Reading Detective.

## 5:1 Can children be taught metacomprehension strategies?

The results from the pilot study appear to indicate that children do not acquire metacomprehension strategies as a result of current teaching methods. Children's performance on three dependent variables designed to assess metacomprehension, did not significantly change as a result of teaching. This was the case whether a novel or mainstream reading scheme was used. There would appear to be sufficient evidence to support the hypothesis that direct action must be taken if children are to learn metacomprehension strategies. As such the main study was concerned with instructing teachers' to teach children metacomprehension strategies. It was recognised that to achieve the above, a two pronged attack would be required. In the first instance, teachers would need to be taught about metacomprehension strategies. In-service training was therefore a prerequisite to further action. Secondly, the teachers and children needed a metacomprehension programme which they could easily follow, and which could be integrated into the mainstream curriculum. Nisbet and Shucksmith (1986) noted that teachers required a structure if they were to be encouraged to implement metacomprehension strategies. A 'recipe book' approach which would lead teachers step by step through a series of exercises was therefore required. The following describes the in-service training, and metacomprehension teaching programme used in the main study.

## 5.2 Introduction to the in-service training programme and development of Mr. Homunculus the Reading Detective.

*'Reading instruction in most classrooms is virtually determined by three factors: teachers' knowledge about reading, the choice of instructional methods, and the availability of reading materials.'* (Paris 1986, p.115).

Each of the three components described above were incorporated and

developed within the metacomprehension programme designed for the present research. Thus, before implementing the programme the teachers in the Experimental groups were provided with in-service training over a three week period, on the research and underlying concepts of metacognition and the relationship of these to reading comprehension. The programme also drew heavily on the research and teaching methods described in the literature relating to the development of reading comprehension (e.g., Palincsar and Brown 1984; Paris, Cross and Lipson, 1984). The metacomprehension programme therefore paid cognizance to the importance of cognitive skills, metacomprehension strategies, and motivation in the development of reading for meaning. Although the potential metacomprehension benefits of the novel were not realised in the pilot study, it was felt that the strength of the novel as a medium for introducing metacomprehension strategies could be facilitated by the intervention programme. Thus, because the novel is commonly used in the classroom it was thought that it would be familiar to teachers, and therefore non-threatening, and could be easily integrated into the current curriculum by embedding the metacomprehension activities within the text, thereby reducing potential work overload, and keeping within the guidelines of the 5-14 curriculum.

### *5.2.1. In-Service Training Programme: Providing Teachers with Knowledge about Metacomprehension*

Durkin (1978 - 1979) noted in her research of classroom teaching practice that teachers of 'intermediate grades' (8 to 11 years of age) rarely provided explicit instruction on comprehension strategies. She also noted that the manuals of most reading schemes in America may direct teachers to become involved in question-answer type sessions, but do not encourage them to provide the children with ***instructions*** as to how to improve comprehension, if they are unable to answer a question. Such observations of the American situation are paralled by observations within the British classroom. Teachers have frequently been observed by the author in excellent question and answer sessions, scaffolding for children the types of sub-questions necessary to help find an answer to the original question. What is missing from such teacher driven models is an explanation to the children by the teacher as to **why** she/he is involved in

the process of scaffolding, and **how** and **when** such a strategy can aid comprehension. From teacher responses to a questionnaire, given originally to those in the Experimental groups and subsequently to participants in other in-service courses (see Appendix 2b), it is apparent that teachers are not actually aware of what they do to teach children comprehension skills, and have a very narrow idea of why they ask questions (i.e, "to see if the children have understood what they have read"!). In contrast, when set the task of thinking about their own reading behaviour, teachers report many strategies which they use to aid their comprehension, but of which they were not previously aware, and therefore did not see the value in explicitly teaching such strategies to children. Paris (1986) notes that: *"How to use context, titles, and prior knowledge or how to skim, re-read, infer, or monitor comprehension are seldom explained and practised" p116.* The first task of the in-service programme was therefore to make teachers more aware of their own thinking skills and strategies used whilst reading, before relating these to the research in metacomprehension.

#### *5.2.1.1 Workshop 1: Week 1: How do we read for meaning?*

A combination of activity learning and information giving was deployed in the in-service workshops. The materials for the workshops are shown in Appendix 2a, Activities 1 to 4. All the teachers participating in the main study were given a questionnaire (Worksheet 1; Appendix 2b) designed to be provocative and to allow the teachers to start to think about their teaching practice in relation to the teaching of comprehension skills. The respondents' answers are shown in Appendix 2b. The initial exercise allowed the discussion to focus on the use of common classroom activities which could be more effectively geared towards the teaching of comprehension skills. For example, it was noted that cloze procedure could not only be used as an assessment tool (normal application), but also as a teaching exercise designed to teach children to read on and back through a sentence or paragraph of text, and to use the meaning and structural cues to make educated guesses at words. By using cloze exercises in this way, and by making the instructions explicit with an explanation as to when such strategies were/are useful, teachers were beginning to teach simple metacomprehension strategies.

Following this simple 'warm up activity' the teachers were given an exercise designed to place them in the position of the novice reader and therefore under stress. The aim was to enable the participants to become aware of the implementation of their own remedial reading strategies, and from this experience, to reflect on their teaching practice to see if they actually taught any of these skills to the children. The teachers were given a difficult passage to read (entitled *'Information Processing')* and asked to think about what was their initial reaction to the passage, and what they found themselves doing whilst reading it.

Typical responses were:

i) 'it was incomprehensible'
ii) 'it was double Dutch!'
ii) "I found myself giving up after the first paragraph"
iii) "I looked at the title and then at the diagram to see if this made it any easier to understand"
iv) "I read very slowly and looked at each word carefully, in the hope that this would shed some light"
v) " I read onto the end of the paragraph and then reread it"
vi) "I started again and tried to answer a question that had occurred to me as I read it the first time and didn't seem to quite tally up with what I thought I had read"

The responses given by the teachers reflected a wide range of metacomprehension skills. Firstly, they demonstrated the self-regulatory aspect of metacomprehension. All of the responses indicated that some self-monitoring behaviour was being used, even at the level of identifying that they didn't understand (e.g., 'It was very difficult", "It was double Dutch"). Such behaviour may be regarded as the first step in the development of metacomprehension and is described by the research in the area (e.g., *"reading for meaning involves that metacognitive activity of comprehension, which entails keeping track of the success with which one's comprehension is proceeding (self-monitoring), ensuring that the process continues smoothly, and taking remedial action if necessary"* Brown, 1980). Children in the same situation frequently continue to read (i.e., "barking at print"), perhaps because they are not aware of their failure to understand, or more

probably, because they perceive the aim of reading as being able to decode the words rather than to gain meaning and information. Such findings are reflected in the work of Clay (1973), Myers and Paris (1978), and Paris and Myers (1981) when they looked at young and poor readers' understanding of what reading was about. All of the teachers in the in-service programme had experience of children behaving in the way described above, but had never considered why they continued to read, or what to do to try and help them become self- monitoring in their reading behaviour. Self-regulatory behaviour triggers the implementation of metacomprehension strategies. It tells the reader: "STOP - I haven't understood that bit". Having identified the problem the reader then has to select an appropriate remedial strategy. The other responses provided by the participants highlighted a number of corrective strategies (e.g., "I read on and back through the text"; "I read more slowly"; "I looked at the title and the diagram"). The strategies identified in these statements are similar to those used by Palincsar and Brown (1982) where high school students were trained through the use of reciprocal teaching, to summarise, question generate, predict and clarify. Such strategies are frequently used in the class-room, but usually at the direction of the teacher and rarely with an accompanying explanation by the teacher to the learner, why he/she might want to look at the title, re-read, read on etc. The assumption made by teachers is that children will incidentally learn from instructions such as: "look at the title - what do you think the story might be about?". For the children, the only reason to look at the title is that the teacher has told them to, not because they are aware that the title can aid future understanding of the passage (i.e., the title usually summarises the story and therefore cues the reader into the content prior to reading). For children to glean this information, they would have to be told explicitly by the teacher, or, eventually learn through repeated exposure and good fortune. Certainly, these kinds of skills have been shown to develop in average to above average readers with maturity (e.g., Cross and Paris, 1988 noted *'a general trend for metacognition and strategic reading to become more congruent from 8 to 10 years', p.1239).*

The main point to be gained by the teachers from their participation in the reading activity was that they should explicitly teach children what, how,

when and why to apply comprehension skills. The teachers were therefore, encouraged to teach children the declarative, procedural and conditional aspects of metacomprehension. By integrating all three components they should move away from simply providing knowledge and skills (declarative and procedural components) toward teaching "skills with will" (i.e., strategies (conditional component, viz. Paris, Lipson and Wixson, 1983).

Finally, the teacher who said "I gave up" provided an example of another important aspect of metacomprehension: that motivation and interest play a large part in children's application of reading strategies. As Cross and Paris (1988) have noted; "metacognition" is not "cold cognition" since it has an affective component which will determine whether or not the child acts on the self-regulatory information or decides to 'give-up' as the teacher in the in-service programme threatened.

The exercises in Workshop 1 helped to contextualise the information and knowledge which the teachers in the Experimental group required in order to understand the underlying rationale of the metacomprehension programme ("Mr. Homunculus - The Reading Detective"). The fact that the teachers were able to experience metacomprehension behaviour for themselves, provided them with greater insight into the theory, and lent credibility to the need for a programme such as Mr. Homunculus.

#### *5.2.1.2 Workshop 2: More Theory!*

Workshop 2 consolidated, through the use of 'talk and chalk', much of what was experienced first hand during Workshop 1. Additional research information was provided, and a handout summarising the main aspects of metacomprehension research and practice was given to the participants (see Appendix 2c: Handout 1).

The aims of the programme were described. These were to:

1) develop children's self-regulatory skills
2) provide children with self-corrective strategies for aiding comprehension

As part of the programme depended on the children, and therefore the teachers, having information about the different types of comprehension questions which could be asked, Workshop 2 introduced Pearson and Johnson's (1978) taxonomy of question-answer categories. As described in a previous chapter, the simplest taxonomy was used to avoid confusion for the children. The types of question were also renamed, again to make the information more manageable. The use of the information and how it was integrated into the programme will be described later. For the purposes of educating the teachers a group activity was used. The teachers were asked to read a passage and answer some questions (see Activities 3 and 4, Appendix 2a). The questions represented at least one type from each of Pearson and Johnson's (1978) taxonomy (i.e., a textually explicit, implicit and scriptally implicit form). In answering the questions the teachers were asked:

1) to label the questions (i.e., to think about what type of question was being asked; Activity 3)

2) to think about how they went about finding the information to answer the questions (Activity 4)

The types of responses provided in the first part of the activity showed teachers using metacomprehension strategies to answer questions, and provided an opportunity for feedback like that obtained during Workshop 1. The kinds of responses given by the teachers when asked to think about how they went about finding answers to the questions were:

I. " I looked for 'key words' in the question and then looked for them in the passage: thus if it said "Who was Sergeant Brown?" I looked for the key words "Sergeant Brown".
II. " I tried to identify whether the question could be answered straight from the text, or if I needed to make an inference".
III. "I identified that I needed to have certain information (i.e., that World War II was in 1942) to answer question 7".
IV. "I looked for the specific paragraph which related to that particular question and re-read it before finding an answer".

In these examples the teachers were demonstrating:

- specific knowledge about question types e.g., in examples i) and iii) the teacher must have known that there are some types of questions that require inferences (Example i) and some which need knowledge (Example ii), and
- simple question answering strategies such as looking for key words (Example i), or paragraphs (Example iv).

To facilitate such developments in children it was indicated to the teachers that they would have to provide similar knowledge, information and strategies for their pupils. At this point Pearson and Johnson's taxonomy was provided.

#### *5.2.1.3 Workshop 3: Looking at the Materials - Classroom Organisational Issues*

Workshop 3 was designed to provide the teachers in the Experimental group with the opportunity to look at the exercises in the metacomprehension programme, and to discuss how they would integrate them into their classroom language work. It was decided by all of the teachers that the material would adequately cover the language curriculum for the first term, and that any other schemes should be put to one side to allow the children to concentrate on the novel. Each teacher agreed to familiarise the children with the content of the novel before attempting the exercises from Mr. Homunculus. In this way they could be sure that the children were familiar with the story content, and had reached a stage of shared meaning and understanding (see Bruner, 1972). Each metacomprehension exercise was therefore introduced to the children as a Mr. Homunculus lesson, thereby reinforcing the metaphor of Mr. Homunculus the Reading Detective. As nearly all of the exercises required the teacher to read the material with the children, and to become involved with them in interactive oral teaching sessions, it was felt that those children with poor mechanical reading skills would still be able to cope with the strategies being taught. For situations where this might be difficult it was agreed that the child would be paired with a more able reader so that they could be supported through the reading process.

### *5.2.2 Mr. Homunculus the Reading Detective: Description of the Programme*

#### *5.2.2.1 Introduction*

The programme developed for use by the teachers in the Experimental groups had two main aims:

1. to encourage children to be aware of their thinking processes whilst reading, thereby encouraging them to be self-regulatory readers
2. to provide children with strategies for attacking reading comprehension problems.

Underlying each of the exercises was the thought that teachers needed to make explicit much of what was generally implicit in their teaching. They were asked to remember to provide the children with explicit instructions about:

i) what the comprehension task was
ii) how to approach the task
iii) when the specific strategies they were teaching should be used
iv) why the specific strategies they were teaching would help aid their comprehension skills

Each of the exercises was therefore designed to ensure that the declarative, procedural and conditional aspects of metacomprehension were applied. This was translated for the teachers as the **what, how, when and why** rule.

The programme was broadly divided into two parts:

- **Part 1** introduced Mr. Homunculus and practised the self-regulatory aspects of becoming a strategic reader.
- **Part 2** introduced Mr. Homunculus the Reading Detective and concentrated on developing comprehension strategies.

In practice each of these broad skill areas operate in unison: the readers monitor their understanding as they decode print and take appropriate

remedial action if they find themselves failing to understand. For children to implement corrective reading strategies they have first to be aware that it is important internally to monitor whether or not they are keeping track of what they are reading. Poor and novice readers do not necessarily deploy self-monitoring behaviour, and certainly not in a structured or proactive way (see Brown, Armbruster and Baker, 1986). It was therefore felt to be important to provide exercises which simply encouraged children to be aware of the importance of self monitoring (i.e., reading for meaning) before introducing any corrective strategies, for as Paris, Lipson and Wixson (1983) have noted: *"The awareness of the need to monitor one's own comprehension during reading, a kind of mental pulse taking, is important for strategic reading"*. p. 301.

The exercises for use by the teachers with the children were prescriptive, providing the teachers with explicit instructions as to what to do, with support materials and exercises provided in the ***Teachers'*** and ***Children's Packs***. The instructions for using the materials were provided in the ***Teachers' Handbook*** (see Appendix 3: Reading Programme). All of the materials were generated from the novel study chosen by the class teacher (i.e., three different novels: The Worst Witch, Foxbusters, and Danny Fox). It was felt to be important to provide prescriptive instructions for the teachers so as to ensure that the same input was provided for all the children in the Experimental groups. Obviously there would have been differences in the individual teachers' style and delivery; however it was hoped that such effects would be minimised by the prescriptive nature of the materials, and eventually by the combining of results from the children of all three teachers. Thus, irrespective of which novel the teachers chose to use, the metacomprehension exercises were the same.

The content and progression of the exercises is described later in more detail.

#### *5.2.2.2 Why Mr. Homunculus the Reading Detective?*

There was a danger that many of the strategies and ideas expressed within the programme might be too abstract, and lack interest and meaning for the children. It was therefore felt to be important to bring to life what might

otherwise be a flat, two dimensional exercise, by creating a third dimension through the use of a fictitious character. The metaphor provided a hook, or 'aide memoire', onto which the children could hang new information and knowledge and also allowed for an interactive relationship with the material being used. In terms of the theoretical underpinning, Mr. Homunculus provided the children with the stimulus and motivation to learn, turned the abstract into the concrete, was a mediator to learning (Feuerstein, 1980) and helped children move towards their 'zone of proximal development' (Vygotsky, 1978) by providing a meaningful focus for activity. But why "Mr. Homunculus" and "The Reading Detective"?

The Collins English Dictionary definition of 'homunculus' is:

> *"1. a miniature man: midget. 2. (in early biological theory) a fully-formed miniature human being existing in a spermatozoon or egg"*

The miniature man was the voice in the children's heads who talked to them as they read, asking them if they understood, telling them to **'Stop'!** if they didn't understand, and generally keeping them on the right track when reading. Mr. Homunculus therefore related to the self regulatory aspects of metacomprehension and was for the teachers, a private adult joke. In addition, the tongue twisting nature of the word was felt to be appealing to children who are frequently amused and interested by 'big' and 'different' words (think of the appeal of nursery rhymes and stories such as Rumplestiltskin, and of children's insatiable appetite for the names of dinosaurs). The appeal of Mr. Homunculus is perhaps exemplified by one child who when asked by a visitor: "Who is Mr. Homunculus?", replied: "Oh! He's a wee guy in yer heed who talks to ye".

The idea of the Reading Detective was drawn from the work by Paris, Lipson and Wixson (1983) who used different metaphors to make concrete for children the various reading comprehension strategies taught in their programme: 'Informed Strategies For Learning (ISL)'. The Reading Detective in the present study encapsulates the specific metacomprehension strategies being taught to the children. For example: looking for clues in the passage (involving strategies such as re-reading, reading on and back), asking questions, and finding answers. Thus,

'Homunculus' and 'Reading Detective' synthesise, in a concrete way, the two main aims of the teaching programme: to teach children to be aware of their reading and to implement appropriate strategies when failures to understand occurred (i.e., to demonstrate metacomprehension awareness and knowledge).

#### *5.2.2.3 Development and Progression of Exercises.*

The programme was divided into two **Parts** with five **Lessons** and twelve **Exercises**. What follows is a summary of each Lesson.

##### *5.2.2.3.1 Part One: Lesson 1: Developing Self-monitoring behaviour*

Lesson 1 was designed to encourage self-monitoring behaviour. Two exercises were used to encourage this:

- Exercise 1 encouraged the children to stop and start whilst reading and ask themselves the question "Do I understand?".
- Exercise 2 drew children's attention to the need for self-monitoring by getting them to spot deliberate errors.

A number of different types of errors were used in Exercise 2, all of which would have rendered the passage incomprehensible, and should have resulted in corrective reading behaviour if the children were reading for meaning and therefore, monitoring their own reading processes. Semantic and syntactical errors were used. Thus, the meaning and/or grammar of the text was changed by introducing a confused word order (e.g., *" ....and she extremely neat **was** in her person ..."*), incorporating nonsense words (e.g.,*"...with her children Spillers was much given to the use of **hatchphrases**.."*), changing the sex of the main protagonists, and creating contradictions and inconsistencies within a sentence or paragraph (e.g., *"With words she was sparing, but what she said was always to the point and when she made a decision or gave an order, **everybody** questioned it"*).

The underlying rationale for the exercise was to draw the children's attention to the importance of reading for meaning and was motivated by research such as that conducted by Markman (1977; 1979) who noted that poor and novice readers, together with older readers presented with a more

complex passage, have difficulty in spotting deliberate errors in text, and tend to read on, irrespective of whether or not the text continues to make sense. Children tend to focus on reading as a decoding exercise rather than a process to gain meaning (e.g., Clay, 1973; Myers and Paris, 1978).

#### *5.2.2.3.2 Part 2: Lesson 2: Developing corrective reading strategies*

Lesson 2 comprised the initial stage of teaching children remedial/ corrective reading strategies. Each of the two exercises in this Lesson were designed to provide reading strategies to be used in conjunction with self-monitoring. The assumption was that the children had learnt *how, when,* and *why* it was important to regulate and evaluate their on-going reading behaviour in Exercises 1 and 2 and now required strategies to allow them to act on the information obtained from self- monitoring. The strategies taught were therefore:

a) re-reading
b) reading-on
c) summarising

The above skills have been identified by researchers as important distinguishing features of good and mature readers. Thus Paris and Jacobs (1984) noted that *"skilled readers ....think about the topic, look forward and backward in the passage, and check their own understanding as they read"* (p. 2083). Such skills are therefore important in promoting comprehension. When used selectively at the discretion of the reader in relation to information obtained from self- monitoring, they become important metacomprehension skills, and move from being simply skills, to skills with will (i.e., strategies viz. Paris et al., 1983). It was therefore important that the teachers not only informed the children about the fact that such behaviours existed, but also provided examples and practice in how to apply them, and when it might be appropriate to use them (i.e, provided declarative, procedural and conditional knowledge). Reminders of the self-monitoring strategies were provided on posters and displayed on the classroom wall along with the other materials generated from the novel study (see Appendix 3a).

#### *5.2.2.3.3 Part 2: Self-Assessment of Understanding*

There are many early reading studies which have demonstrated the effectiveness of self-generating questions about a text in aiding and enhancing comprehension. Andre and Anderson (1978-1979), Singer (1978), and Collins, Brown and Larkin (1980), and more recently, Baumann, Seifert-Kessell and Jones (1992) have all demonstrated the positive effects of training children to actively interact with a text by generating questions and answers related to the content. In fact, Collins et al. (1980) suggests that many failures of comprehension are due to an inability to ask the right questions.

In addition to being able to generate questions about a text, it is important that the reader understands **why** question generating and answering is important, so that they can then decide when it is appropriate to use the skill. Such conditional knowledge has been shown to be a critical success factor not just in relation to asking and answering questions, but in other similar skills such as underlining, note taking and summarising (e.g., Decker and Sullivan, 1990; Malone and Mastropieri, 1992; Puntambekar, 1995). Brown (1978) makes the following comments in her summary of such research: *"Taking notes or underlining is not in itself a desirable end. Understanding that one should use these activities as aids to focusing attention appropriately is the desired end point of training"* (pp. 46 ). *....."Detailed, informed instruction of the purposes of outlining and methods of using the strategy intelligently are needed before sizable benefits accrue"*. (pp. 47). 'Cognitive training with awareness' (Brown, 1978) and 'skill with will" (Paris et al., 1986) are therefore important themes if children are to become self regulatory and independent readers.

Given the above research the exercises in Part 2: Lessons 3 and 4, concentrated on building and developing children's ability firstly, to generate questions, then to identify different types of questions, and finally to use such skills and knowledge to help aid comprehension at both literal and inferential levels.

#### *5.2.2.3.4 Lesson 3*

The exercise in Lesson 3 encouraged the children to stop periodically in their reading and to ask themselves a 'what, why, where, when, and how' question. Before doing this independently and in small groups, the teacher modelled the behaviour for the children and talked them through the strategies used. In addition to direct teacher prompts there were also notice boards of Mr. Homunculus the Reading Detective reminding the children of the different types of interrogatives (see Appendix 3b). At the end of the lesson the teachers were instructed to ask the children when they would use Mr. Homunculus' reading detective skills and were told that they would want to establish for the children:

I. that it is a good skill to use whenever they are asked to read
II. that it will help them to better understand what they are reading, and
III. it will help them to answer questions which others might ask of them

#### *5.2.2.3.5 Lesson 4*

Lesson 4 developed the theme of asking questions and demonstrated for the children the relationship between the type of question (i.e., literal or inferential) and the likely answer. The aims of the lesson were outlined as being:

1. to teach children the relationship between questions and answers
2. to teach children how to formulate literal and inferential questions, to be able to identify these categories, and to know when and why to use the skill
3. to teach children to relate the question category to the likely amount of interpretation required to find an appropriate answer.

#### *5.2.2.3.6 Part 2: Lesson 5: Consolidation and Generalisation*

Lesson 5 consisted of two exercises. The first exercise was in some respects a test, since it presented to the children a passage with deliberate errors, to ascertain whether or not they spotted the inconsistencies without teaching. It was assumed that if they had learned self-monitoring behaviour from Lesson 1, then they should be adept at spotting the errors in the passage, thereby providing an assessment of whether or not they had

mastered the learning presented at the beginning of the programme.

The second exercise was designed to assess whether the children had learned any of the specific reading strategies, together with an awareness of the importance of self-monitoring. In addition, it was hoped that the exercise would indicate the transfer of skills across the curriculum to areas such as mathematics. The children were therefore asked to write a letter to their teacher's friend to provide her with advice for a child in her class who was having difficulty with reading his SPMG Mathematics. No preparation was given to the children and they were not prompted by their teacher with reminders of Mr. Homunculus.

### *5.2.3 Teaching Strategies Employed*

Throughout the above description, references have been made to the teaching methods used to instruct the children in the use of metacomprehension strategies. The following outlines in more detail the specific teaching methods deployed.

As noted in the introduction, it is important for teachers to make explicit the strategies which should be used to aid comprehension and to ensure that one's reading behaviour is kept under constant review. Too often teachers assume that exercises such as cloze procedure, asking questions, and spending time discussing the possible content of a passage prior to reading, will be internalised by the children and used by them independently as an aid to comprehension. Research tends to demonstrate however, that such instruction needs to be made explicit for children, since it will not automatically lead to incidental learning (e.g., Duffy et al., 1986). In their review of the literature on metacomprehension training programmes, Winograd and Hare (1988) identified five key features to include in any instructional comprehension programme:

1. describe the crucial features of the strategy, define it, label it, and make it sensible
2. explain why the strategy should be learned
3. show how to use the strategies with modelling, thinking aloud, and other techniques so that children understand the discrete steps

involved

4. explain the different circumstances under which different strategies should be employed
5. explain how to evaluate whether the strategy was successful

In the Teachers' Handbook, the teachers were encouraged to employ each of these five factors, (encapsulated in the **where, what, when and why** rule). The previous discussion about the content of the metacomprehension programme cover points 1., 2., 4., and 5. above. What follows is a discussion about the actual teaching methods used to encourage and develop metacomprehension skills, namely:

- Direct explanation
- Reciprocal teaching
- Modelling

### *5.2.3.1 Direct Explanation*

It is important for teachers to be explicit about when, how, and why to use a strategy. This is sometimes best achieved by providing information and knowledge directly to the child. There are many examples of this type of teaching in Mr. Homunculus, the most obvious shown in Lesson 4: Exercise 7, when the children were given information about the different types of questions which can be asked (i.e., literal or inferential). Apart from this example, where there is a clear intention of providing the children with specific knowledge, there are constant examples throughout the programme of the teacher providing instructions as to how to use a strategy and when.

For Example: <u>Part 1: Lesson 1:Exercise 2: **"Instructions":**</u>

*".....2) Explain to the children that sometimes when we are reading, Mr. Homunculus tells us that there is something not quite right about what we are reading - something which doesn't make sense. When this happens Mr. Homunculus is telling us to STOP reading because we don't understand - we have lost track of the story."* .....(see Teachers' Handbook pp. 4).

In this example the children are given explicit and direct instruction as to the nature of self-regulatory behaviour. The instructions go on to provide learning experiences using a combination of modelling and direct instruction.

#### *5.2.3.2 Reciprocal Teaching*

Palincsar and Brown (1984) used reciprocal teaching in their metacomprehension training programme designed to teach children to predict, question, clarify and summarise. It has since been used by others, in conjunction with other teaching strategies, to produce strategic readers (e.g., Lysynchuk et. al., 1990; Bruce and Chan, 1991; Taylor and Frye, 1992). Essentially the technique is one of role playing, requiring the teacher to model for the children a reading/learning strategy. After having established the strategy, the child then assumes the role of the teacher and performs the same strategy with the teacher acting as the learner. Through turn taking the child learns how and when to use the strategy appropriately. It also allows the teacher to provide immediate feedback about the child's behaviour, thereby shaping better performance. The idea might be likened to Bruner's theory of how a baby learns language - i.e., through reciprocity of interaction resulting from an action dialogue between infant and mother. The action dialogue and reciprocity of interaction in Palincsar and Brown's study is between the child and teacher. In Mr. Homunculus there are many examples of this specific strategy (see for instance Exercise 3). Frequently the teacher is encouraged to model an appropriate reading strategy, then to ask the children to take over and pretend to be the teacher and model the same behaviour. On some occasions the teacher would provide feedback about performance, on others the children would assess another child's performance and provide examples of how they would have performed the same task (see for instance Exercise 5). In this way the children were given access to both the teacher's internal thought processes and those of their peers.

#### *5.2.3.3 Modelling*

Modelling is frequently used in conjunction with the other two teaching methods. Basically the teacher models for the children a strategy and/or their thinking processes whilst reading. For example in Exercise 1 the

teacher was asked to model stopping and starting behaviour, so as to externalise for the children the type of self-monitoring behaviour which 'good' readers deploy whilst reading. The teacher is modelling self-regulatory behaviour, but is also giving the children examples of appropriate places to stop, together with a direct explanation as to why it might be appropriate to stop (i.e, at the end of a paragraph, or a particularly long and complicated sentence, or at a point when the teacher found she was no longer concentrating). In this exercise there are also examples of reciprocal teaching and collaborative peer tutoring (i.e., where the children model the strategy for other children). The positive effects and potential of peer tutoring in reading are well documented by Topping (1988; 1990), providing further justification for the use of the method when teaching metacomprehension strategies.

#### *5.2.3.4 Summary of Teaching Methods*

Although the different teaching methodologies have been discussed under separate headings, it is clear that in practice the three would frequently operate in unison. Direct explanation, reciprocal teaching and modelling are supportive instructional teaching strategies designed to promote independent learning. Together they mimic the kind of teaching and learning which can be observed between parents and their children: principally a cycle of informing *(direct explanation*), modelling, guiding, observing, correcting *(reciprocal teaching)* and encouraging (see Rogoff and Gardner, 1984). Such coaching methods depend on a shared context, a sensitivity on the part of the teacher to know when is, and is not, a good time to intervene to provide guidance, and knowledge about the gaps in a pupil's learning. It is hoped that the novel provided the teachers and pupils in the Experimental groups with a shared context for learning. The process of modelling and interacting around the text should have provided the teachers with an insight into the children's developing schemata in relation to metacomprehension strategies, and afforded them the opportunity to guide the children's learning more effectively. Reciprocity of interaction was therefore an essential feature of the instructional techniques.

Oral presentation was the principal mode of the instructional methodologies. Independent reading and writing activities could only be

achieved after the children had been led verbally through the processes involved in thinking about their own thinking. Most lessons were broken down into two teaching parts: the oral part using modelling and reciprocal teaching methods, and the independent learning part, where the children were asked to complete an exercise by themselves. Each exercise built on the children's knowledge and experience gained from previous tasks, and led them gradually through a process starting with direct explanation, moving onto modelling (where the teacher 'made public' (Paris 1986) her thinking and learning strategies), to guided practice using reciprocal teaching, and finally, to independent activity. Examples of this process are demonstrated in Exercise 7 through to 9 (see Teachers' Handbook pp. 17-23).

The programme was designed to last six weeks, the normal duration of a novel study, and would therefore end at the same time as the Control group. Given that there were 12 lessons, the teachers were asked to do two exercises per week. Each exercise was designed to last for 1 hour.

# Chapter 6: The Training Study: Teaching Metacomprehension Strategies

## 6.1 The research questions

The aim of the main study was to assess whether children could be taught metacomprehension strategies using a metacomprehension instructional reading programme. It was assumed, as in the pilot study, that if children could be taught metacomprehension strategies, then they would be more able to perform in a cloze test, to answer inferential questions, and to generate their own questions as a self- monitoring strategy. Given the measurement problems experienced in the pilot study, the dependent variables were modified, and are discussed in the method section.
It was also hypothesised that the effects of training would be greater for poor readers because of their more limited metacognitive awareness and consequent reading ability (e.g., Wong and Jones, 1982; Paris, 1991; Wright and Cashden, 1991; Feitler and Hellekson, 1993).

The study is based on the premise that children who participated are not currently being taught metacomprehension strategies, that such strategies are important if children are to *independently* read with understanding, and that to achieve strategic readers, *explicit* instruction in metacomprehension is required. Such assumptions are based on the results from the present pilot study, together with those from previous research (e.g., Paris, Cross and Lipson, 1984; Paris and Oka, 1986; Baumann, Seifert-Kessell and Jones, 1992; Mateos and Alonso, 1994). In addition, given that the 5-14 curriculum guidelines for English language (SOED, 1991) encourage the acquisition of higher order reading skills, which it has been argued necessitate the use of metacomprehension strategies, there is additional justification for attempting to investigate whether children can be taught such strategies.

The questions under investigation were therefore:

**1.) Can children be taught metacomprehension strategies by teachers?**

**2) If metacomprehension strategies can be taught, are there greater benefits for poor, as compared with good, readers?**

To investigate such questions it would be necessary to:

I. train teachers in metacomprehension
II. produce an instructional programme aimed at developing metacomprehension strategies
III. have the trained teachers implement the programme with a group of children to determine its effects.

Chapter 5 has described the first two components, namely training and programme development; the following sections describe the implementation of the programme with a group of mainstream Scottish children (mean age 9 years 6 months).

A repeated measures design was used with matched control and experimental groups subjected to pre- and post- tests before and after intervention.

## 6.2 Method

### 6.2.1 Sample

60 primary 5 children (mean age 9 years 6 months) from six West of Scotland primary schools participated in the study. The schools were selected from a demographically matched group and randomly assigned to experimental and control conditions. All schools had matched populations in terms of the number of children in receipt of clothing grants and free school meals. Equivalent experimental and control groups were achieved by matching the children's Burt Word Reading score test results (Burt, 1976). Thus, five children from each class and school were above or below average readers, scoring 12 to 18 months above or below their chronological age (CA) as measured by the Burt Word Reading Test (Burt, 1976). An independent t-test indicated no significant differences in the scores of the experimental above/below average readers vs control

above/below average readers (p> 0.05 for both statistical comparisons). The equivalence of the groups was further verified by the non significant pre-test scores obtained on all three dependent variables. The sample was therefore matched according to age, socio economic status, (SES) and Burt Word Reading Score.

Of the original sample of children 5 needed to be replaced, 3 from the experimental and 2 from the control groups. One child in the experimental group met the matching criteria in terms of age, Burt Word Reading Test result and SES but was found to have suffered a brain injury as a result of a road traffic accident aged 3 years. This was felt to be a possible confounding variable and she was therefore replaced. The other children were replaced because their Burt Word Reading Score did not meet the criteria for selection into the above or below average groups. The mean reading age for the above average subjects was 128 mths, and for the below average subjects 98 mths (mean CA 110 mths).

Thirty children, 10 from each of three different primary schools comprised the experimental group, and 30 children, 10 from each of the other three primary schools, comprised the control group. Of the 30 children in the experimental group, 16 were male and 14 female and in the control group, 18 were male and 12 female. When broken down into above and below average readers there were 6 males and 7 females in the experimental above average group, and 10 males and 7 females in the below average experimental group. In the control group there were 7 males and 5 females in the above average group and 11 males and 7 females in the below average reading group. The distribution of males to females in the two reading ability groups is representative of school populations in terms of above and below average readers, (i.e., there is a greater probability of a poor reader being male than female within the general school population). The sample may therefore be regarded as 'representative' of the population being investigated and any results can therefore be generalised beyond the sample used in the present study (viz. Kerlinger, 1979 p. 119).

Both the experimental and control groups were using novel studies to develop reading comprehension skills as detailed in the 5-14 language

programme, but neither group was receiving any metacomprehension training The introduction of the intervention programme, Mr. Homunculus the Reading Detective to the experimental group provided the independent variable. The children were drawn from different schools in the belief that this would allow the results to generalise beyond the effect of a single teacher and school.

### 6.2.2 Measures (Dependent Variables)

It was felt that the measurement tools deployed in the pilot study were conceptually valid but required technical adjustments. Thus, the same three dependent variables were used (i.e., cloze, comprehension and question generating tests), but the content of the tests was changed to account for problems identified in the pilot study. The following is a description of the test materials used in the main study.

#### *6.2.2.1 Question Generating Measure (QG)*

The same rationale for using the question generating technique as that espoused in the pilot study holds for the main research programme. It was assumed that by asking pupils to formulate, and state questions about a text they have read, and by analysing them using Pearson and Johnson's (1978) taxonomy it should be possible to assess the level of pupils' metacomprehension development. Simply asking questions about the text provides a crude measure of metacomprehension development. Thus, one might expect children to increase the amount of questions they are able to generate about a passage as a result of metacomprehension training. However, the type of question generated provides a more sophisticated qualitative measure. The assumption being that scriptally and textually implicit questions (see Section 4.4.1 for definition) are indicative of greater metacomprehension strategy development than textually explicit questions.

It would be expected, that as the children developed better metacomprehension strategies their level of comprehension would increase, and this would be reflected in the type of questions which they formulated as a means of monitoring their understanding whilst reading. A move from textually explicit to textually and scriptally implicit questions would reflect increasing analysis of text and increasing

metacomprehension development. It is predicted that the number and quality of questions should improve as a result of intervention, and that the below average readers should benefit most.

Different reading passages were used in the main study because it was felt that those used in the pilot study were too easy for the below average readers in terms of content and length, and as a result did not provide sufficient scope for generating implicit questions. In the present study the children were given a passage to read pre- intervention and a different passage but matched for reading difficulty, post- intervention. The passages were taken from the Neale Analysis Of Reading Ability: Revised British Edition (Neale, 1989), and were selected according to the indicated reading skill level required to decode them (see Appendix 4a for QG materials). Such information was used to ensure that the above and below average readers were given passages which were within their mechanical reading skill level, as measured previously by the Burt Word Reading Test (Burt, 1976). The Neale has three parallel forms designed for test- and re-test purposes. The cross-test reliability of the parallel forms of the Neale Analysis is questionable because most of the reliability data were obtained from samples using Form A. Forms B and C were tested for validity and reliability using much smaller samples and thus the accuracy of such data may be questioned. However, in the present study the cross-test reliability of the parallel forms is not entirely relevant since the same passages were given to both the experimental and control children pre- and post-intervention and therefore, any possible differences in the readability or interest levels of the passages would be the same for both groups.

One advantage of using the Neale Analysis passages from the parallel forms was that they were of a similar length for both the above and below average groups which meant that neither group was advantaged, or disadvantaged by having more, or less content from which to generate questions.

As in the pilot study, the children were asked to read the passage silently and were told that after they had finished they would be asked to pretend that they were the teacher and to ask the Experimenter as many questions

about the passage as they liked, and that the Experimenter (pretending to be the pupil) would try to answer them. It was made clear to the children that the Experimenter had read the passage and was therefore in a position to answer their questions. The Experimenter also had a copy of the passage to which to refer. The children were told that they could look at the passage and did not have to try to remember it. This was an additional instruction to those provided in the pilot study, since it was found that the children in the pilot thought they had to memorise the passage. No time limit was set, thus the children were asked to generate as many questions of which they could think, and testing stopped when the children indicated that they had finished. The data for each child consisted of lists of questions pre- and post- intervention which were analysed in terms of the total number of questions generated and the type of question (i.e., textually explicit, textually implicit and scriptally implicit).

As noted previously, it was expected that if the intervention programme was effective then this should be reflected by:

I. the total number of questions generated post- intervention, and
II. the type of question generated

#### *6.2.2.2 Cloze Test Measure*

The Gapadol Reading Test (McLeod and Anderson, 1973) was used as a measure of metacomprehension skills. It is a standardised norm referenced test with two parallel forms which were used pre- and post- intervention providing reading/comprehension age scores. The Gapadol was used as an alternative to the Gap Reading test (McLeod, 1970) because it is specifically designed to cater for a wider range of reading attainment, thereby avoiding the danger of a ceiling effect for the more able readers. Like the GAP test, the GAPADOL was originally standardised on an Australian population and later on a British sample drawn from a mixed SES group across the UK. The median internal consistency coefficients of the test for five different age groups (7.3 yrs to 8.3yrs ...15.3yrs to 16.3yrs) is high at 0.91. As in the GAP test the norms for the GAPADOL were compiled in 1970 and could therefore be regarded as outdated. However, it is one of the few cloze tests to use passages rather than individual sentences and is deliberately constructed to "discriminate at high ability and age level".

Given the reading aptitude of the above average reading groups in the present study together with the arguments outlined in Chapter 1 Section 1.8.2.1 regarding the merit of passages rather than individual sentences in cloze tests for measuring change in metacomprehension, it was felt that on balance the GAPADOL provided a meaningful measure despite the age of its standardisation data. In addition, since it was being used as a measure of change for both experimental and control groups any failings inherent in the norms of the test would be the same for both groups.

The rationale for using a cloze test was the same as that outlined previously in Section 1.8.2.1, namely that to perform well in a sentence completion type exercise (as in a cloze test), the reader needs to deploy self-monitoring strategies to read with meaning, and to instigate appropriate remedial strategies, such as re-reading, when failures to understand are detected, all of which describe metacomprehension behaviour.

The data from the cloze test are presented as gain scores and reported in months.

#### *6.2.2.3 Comprehension Measure*

If the development of metacomprehension skills is defined in terms of improvements in reading for meaning, then measures of reading comprehension, it could be argued, should reflect gains in metacomprehension strategies. Such an argument has been instrumental in the use by researchers of comprehension tests as a behavioural measure of metacomprehension development, and will be adopted here too.

Five literal and five inferential questions were constructed from four short narrative passages taken from Helen Arnold`s 'Making Sense of It' (1984). Some of the passages used in the pilot study were changed in the main study because of the reasons discussed in Chapter 4, namely that, it was felt that the passages used for the poor readers in the pilot study did not facilitate the development of inferential questions as compared with those passages used for the good readers. In changing the passages for the poor readers it was necessary to make changes to the good readers' passages

in order to maintain a differential in the reading ages of the passages chosen for good and poor readers (see Appendix 4b).

As a means of validating the question types a procedure similar to that described by Crowell, Au and Blake (1983) was used. The passages and questions were given to an independent judge (experienced in educational matters) who was asked to categorise them into literal and inferential question types as defined by Pearson and Johnston (1978). On the basis of this information 80% agreement was found. The two questions where consensus of question type was not found were changed and the same procedure repeated until 100% agreement was achieved. As with the QG measure, each of the passages chosen pre- and post- intervention were within the child's mechanical reading skill level as measured by the Burt Word Reading Test (Burt, 1976). The below and above average readers were therefore, given different reading age passages and accompanying questions pre- and post- intervention (see Appendix 4b). To help ensure that the pre- and post- test questions were comparable for each group of readers (i.e., above and below average readers) the questions used for pre- and post- testing were given to a pilot group of 20 mainstream pupils with reading ages which matched the readability levels of the comprehension passages. The answers to the pre- and post- test questions were scored for each child and a Pearson r was computed to determine the correlation between the answers provided by the children for the pre- and post- test questions. A positive correlation of 0.88 was obtained ($p<0.005$ level, 1-tailed, df= (n-2) =8) indicating comparable difficulty levels.

Given that children deploying metacomprehension strategies will arguably be better able to answer questions about a passage but particularly inferential ones, it was predicted that if the children were developing metacomprehension strategies then the children in the experimental group:

I. would answer correctly significantly more questions post-intervention and
II. show significant improvement in their ability to answer inferential questions.

In addition, from the research contrasting the differential effects of

metacomprehension training for good and poor readers (e.g., Wong and Jones, 1982; Malone and Mastropieri, 1992; Puntambekar, 1995), it was expected that the above improvements would be greater for those children in the below average reading group.

The comprehension questions were administered orally. The children read the passage silently and when finished they were asked each of the 10 questions, one at a time, by the examiner. They were told that if they did not understand or hear the question then it could be repeated for them, however no tutoring was allowed to assist the children's understanding of the question. The passages were not removed from the children, but left face upwards on the desk, or remaining in the children's hands. The children were not directly instructed, or given non-verbal indications that they should, or could use the passage to answer the questions. If the child asked for permission to look at the passage to answer a question (e.g., "Can I, or is it all right, if I look at the story"?), they were given a positive response.

Using the passage to look for answers is an indication that readers are deploying appropriate metacomprehension strategies since they are aware that the purpose of reading is to gain meaning, and that if unable to answer a question, then it would be appropriate for instance, to read over and back through the text, or look for key words. Reading in this context is not perceived as a memory task, but rather, as a strategic, metacomprehension activity. It would therefore, have been inappropriate in the administration of the comprehension test to guide the children towards using the passage for reference in order to answer the oral comprehension questions, or to prevent them from doing so independently by removing the passage, hence the reason for the above procedure.

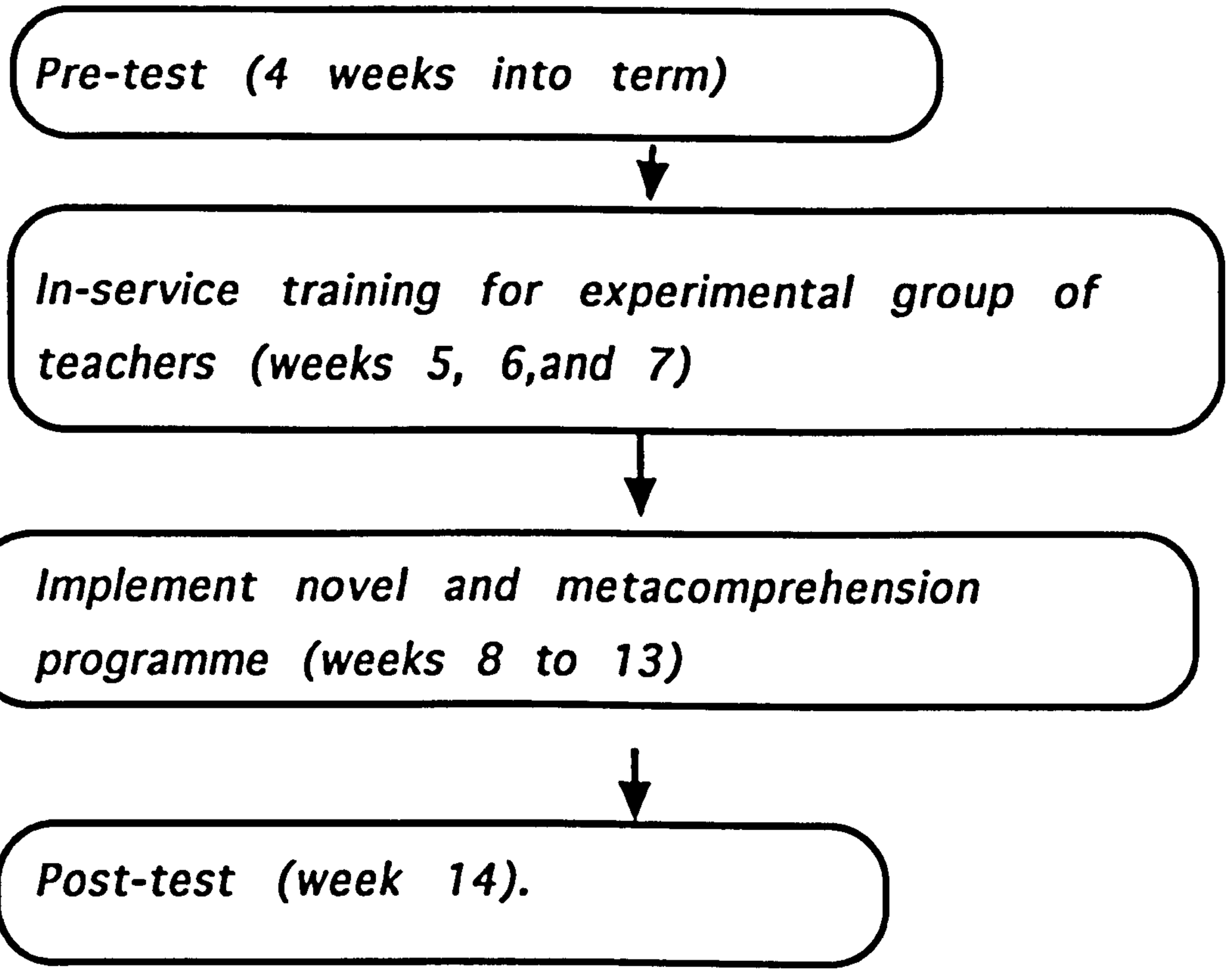
### 6.2.3 Procedure.

All children participating in the study were assessed using the three measures described above. The tests were administered to the children in the same order (viz. 1. Question Generating 2. Cloze test 3. Comprehension test) for the reason outlined previously in the pilot study, that is, to avoid unintentional tutoring in the question generating measure from the

comprehension test, the comprehension questions acting as exemplars for the question generating measure). The pre- tests were administered four weeks into the winter school term (i.e., the first two weeks of September) and the post- tests, nine weeks later during the first two weeks of December. Such timing ensured that all of the children were pre-tested before the teachers in the experimental group were given in-service training on metacomprehension and the programme to be implemented. It further ensured that post-testing took place after the children had completed the last metacomprehension lesson and at the end of the novel study. The timing of the pre- and post- testing was important for two main reasons:

I. had the teachers in the experimental group been 'in-serviced' prior to testing, they may have, unconsciously, started to use some of the metacomprehension strategies, thereby advantaging the children in the experimental group, and contaminating the pre-test results.
II. the novel study had to be completed in both the experimental and control groups before post-testing so as not to advantage or disadvantage either group.

The procedural time scale was thus:



The cloze test was administered by the class-teachers as a group test. The test was given to the whole class so as not to highlight those children participating in the study, and had the added benefit of providing valuable reading assessment information for the class teachers' records. The QG and Comprehension tests were administered consecutively to each individual child by the Experimenter and two assistants who were educational psychologists. The assistants were given instructions about how to administer the tests and in which order, but were blind to the aims of the study, and whether or not the children were in the experimental or control groups. Within the constraints of 'real world research' (Robson, 1993), it was hoped that the above measures would help to control for the possibility of experimental bias resulting from all data being collected by the Experimenter. As in the pilot study, the children were not told they were being tested, but rather that they were assisting in the assessment of new reading materials and had been specially chosen by their teacher to help the researcher. This was done in an attempt to reduce the possible anxiety which may have occurred had the children thought it was a test situation.

The teachers in the experimental and control conditions were asked to start their novel in week 8 of the research phase; this ensured that the in-service training for the experimental group teachers had been completed, and both groups were starting the language work associated with the novel at the same time. The experimental and control groups used the same three novels, namely 'Foxbusters' (King-Smith, D., 1978), 'Worst Witch' (Murphy, J., 1978), and 'Danny Fox', (Thomson, D., 1966) . The novels were chosen because of their interest levels and were stories which are commonly used at the primary 5 stage. The reading ages of the three novels were not identical, but since they were the same for experimental and control groups, this was not felt to be a problem. Of the three novels used, one was above the children's chronological age ('Foxbusters'), one below ('Worst Witch') and one matched to their age ('Danny Fox').

Both control and experimental group children were using the same novels, the difference between the groups being the use of the metacomprehension programme, Mr. Homunculus the Reading Detective, by the experimental group. By using different novels and matching these for the experimental

and control conditions, any possible benefits from the metacomprehension programme could be assumed to be due to the intervention and not the particular novel used. This was important, since as noted in the introduction, metacognition is not 'cold cognition' (Paris, Cross and Lipson, 1984), but has motivational and affective components. If the novel was found to be uninteresting it could affect the children's motivation and enjoyment, thereby influencing their level of participation and consequent performance. Such an effect would bias the results; by matching the novels it was assumed that if one or more of the three novels was found to be uninteresting, the effects would be the same for both the control and experimental groups.

The teachers in the control condition were asked to implement their normal language curriculum centred around the novel. Typically, this involved the class teacher in reading and discussing some of the novel each day with the children thereby progressing the story. On approximately two occasions during the week more structured activities related to the story would be given to the children. Such activities would usually begin with the teacher discussing, through the use of questions and answers, the content of the passage just read, with the children. After class discussion the children might be set a written comprehension exercise such as a cloze passage taken from the novel, or more typically a worksheet with written questions about the story, to be completed individually within differentiated groups, that is class groups organised according to reading ability and comprising between 5 and 8 children. The teacher visited the groups to offer individual assistance and additional input where necessary. Such assistance involved for instance, reading the question for a child with poor mechanical reading skills, directing a child to an appropriate point in the passage to find an answer to a question, or explaining what a particular word meant. It was generally accepted by the teachers in the control groups that the prior oral discussion related to the novel should have enabled the children to complete the written comprehension exercises without too much further teacher intervention. In addition to the written comprehension exercises and oral discussion which took place around the novel, the children were also involved in drawing pictures of the characters, writing a short summary of the story, or character, all of which were used to develop a school frieze

depicting the actions, and characters within the novel.

In the experimental condition the procedure was similar except for the metacomprehension exercises. The teachers read the novel to the class, discussing the content in a similar way to that experienced by the control group children, and progressing the story to the point at which they could introduce the lessons from 'Mr. Homunculus - The Reading Detective'. Two of the metacomprehension training lessons lasting approximately 1 hour each were administered per week. Such lessons were instead of the written cloze and comprehension exercises undertaken by the control children. Teachers were also encouraged to remind the children of Mr. Homunculus when they were involved in other reading activities within the classroom thereby reinforcing the messages taught during the Mr. Homunculus exercises. Like the control children, the experimental groups were also involved in drawing pictures and writing short summaries of the story and characters to develop a class frieze. Within such classroom wall displays, Mr. Homunculus billboards were also shown (see Appendix 3). The time spent on the novel and associated language work in both the experimental and control groups was the same, the preferred mode of presentation was also similar (i.e., oral discussion about the novel), the main difference being the content of the reading activities presented to the children. The experimental children had metacomprehension activities, presented orally, and in written form, and to be completed in writing or verbally, in groups, pairs, or individually. In contrast the control children did not have any explicit metacomprehension activities, but instead had more traditional comprehension activities such as answering questions from a worksheet or completing a cloze passage.

## 6.2.4 Results: Scoring system used for each measure

### *6.2.4.1 Cloze Test (Gapadol)*

The guidelines and norms provided in the test manual were used to provide pre- and post- intervention reading ages, calculated in months.

#### *6.2.4.2 Question Generating Measure*

The data collected from the QG measure were in the form of lists of questions for each subject pre- and post- intervention. The total number of questions generated pre- and post- test were summed for each subject providing a measure of the number of questions generated irrespective of question type. In addition, the questions produced by each subject were categorised according to Johnson and Pearson's (1978) taxonomy (i.e., textually explicit, textually implicit, and scriptally implicit). Thus, in addition to the total number of questions generated, each subjects' responses were also scored according to the number of each of the three question types noted above. In this way a qualitative analysis of the data could be made. In order to check the reliability of the Experimenter's categorisation an independent judge with knowledge of the primary curriculum was asked to mark a random sample of 10 subject's responses. The second marker was asked to categorise each of the subject's responses into the three categories of question type. The results from the second marker and those of the Experimenter were compared using a Kappa coefficient (Cohen, 1960). As noted in Chapter 4, this statistic provides a measure of the *agreement*, rather than *association*, between two judges, and is therefore more appropriate in the present context than a Pearson r. The other advantage is that only one computation is required, as compared with three for the Pearson r, one for each question category. A Kappa coefficient of 1 indicates perfect agreement, and 0, no agreement. The Kappa coefficient computed for the above random sample of 10 scripts was 0.83 indicating an acceptable level of agreement between markers' categorisations. Such results compare favourably with those of Crowell, Au and Blake (1983) who found 90 to 94% agreement between judges when using the above categorisation system.

#### *6.2.4.3 Comprehension Measure*

Each subject was given a score of 1 if their response to the question asked was correct. As there were 5 literal and 5 inferential questions each subject had a mark out of 5 for each section and a composite mark out of 10. As with the QG measure the same independent judge was asked to mark a random sample of 10 response sheets to check the reliability of the Experimenter's marking. A raw score out of 10 for each of the 10 response

sheets was obtained using this method. A Pearson's r was computed in order to measure the degree of correlation between the two marker's scores for the same 10 response sheets. A positive correlation of +0. 84 was computed ($p < 0.005$, 1-tailed, df=8) indicating a strong significant correlation between markers.

### 6.2.5 Analysis of Data

A pre- and post- test repeated measures design with control and experimental groups was used. Schools matched for socio-economic variables were randomly assigned to experimental and control conditions. Children in experimental and control conditions were then matched according to their Burt Word Reading score and assigned to the above and below average reading groups within the experimental and control schools. Randomised designs such as that described ensures that groups are equivalent thereby producing internal validity and allowing certain inferences to be made. Importantly, it can be assumed that any change in the dependent variable is due to the influence of the independent variable (Cook and Campbell, 1979; Robson, 1993). Parametric statistics which are essentially inference statistics and based on the above population assumptions were therefore used in the analysis of two of the three dependent variables (i.e., cloze and comprehension test measures).

As in the pilot study it was not felt to be appropriate to use parametric statistics on the question generating measure because of the distribution of scores which resulted when the number of questions were analysed and broken down into the three categories of questions. Although the data obtained from this procedure were still of a ratio form the distribution of the data did not conform to the normal parameters associated with the use of parametric statistics. Specifically, when the total number of questions generated were broken down into the three categories of questions (i.e., textually explicit, and textually and scriptally implicit), the distribution could not be considered as linear and lacked 'homoscedasticity' (equal variances, viz. Siegel, 1956). In order to use an analysis of variance (ANOVA) it is assumed that the means of the population are linear, together with being normally distributed and of at least an interval scale of measurement. Given the non- linear nature of the data highlighted by the

large number of zero scores observed in the raw data for two of the three question categories (textually and scriptally implicit, see Appendix 5) it was decided to use non-parametric statistics for the analysis of the question generating measure. The use of ranks as deployed in non-parametric statistics matched more precisely the data obtained from this measure. In the conditions described, non-parametric statistics were considered as a more powerful statistical tool (i.e., would have a high probability of rejecting Ho when Ho was false, Siegel, 1956), than would have been achieved from an F test, in circumstances where the data so clearly lacked homogeneity (see Kerlinger, 1979). Only those planned comparisons relevant to the hypotheses being investigated will be discussed, thereby providing a more focused account of the data than that presented in the pilot study.

A further refinement was made in the main study in relation to the analysis of data obtained from the cloze and comprehension tests, namely the use of gain scores. Experience obtained from the analysis of data in the pilot study suggested that the use of gain scores (i.e., post-test scores minus pre-test scores) may have simplified the analysis by providing a measure of change in performance post- intervention, aiding in the interpretation of the results. However, whilst arguably simplifying the analysis, gain scores can infact cause interpretative problems if the samples in the experimental and control groups are not equivalent. This is particularly so when an F-test is used as the statistical tool for analysis. In these circumstances some researchers would suggest that adjusted means as deployed in an analysis of covariance (ANCOVA) provides a more linear relationship between the independent variables when factors such as ability, and age are uncontrolled (Youngman, 1979; Iverson and Tunmer, 1993). The concern is therefore related to the comparability of the groups. If the groups are not equivalent on criteria significant to the research questions, then it can not be demonstrated that changes in performance as indicated by gain scores, are due to real change or regression factors (see Youngman, 1979). The ANCOVA is therefore, a useful statistical tool to be used when significant variables have not been, or are unable to be, controlled for in the experimental design.

Given that the children in the present study were particularly selected to

represent two different groups of reading ability the author would argue that an ANCOVA is inappropriate since it would have the effect of adjusting the means of the above and below average readers so as to eliminate the deliberately selected for differences. Additionally, the pre-test scores for the cloze and comprehension tests (where an F-test would be used for analysis) were not significantly different for the experimental and control groups. Specifically, planned comparisons using independent t-tests between experimental*above vs control*above average readers, and experimental*below vs control*below average readers were not statistically significant (E*A vs C*A: $p>0.05$ (N=30); E*B vs C*B: $p>0.05$ (N= 30)), indicating comparability of the matched samples. For the above two reasons it was considered appropriate to use an ANOVA, rather than an ANCOVA for the statistical analysis of the gain scores.

The results for each measure are reported below and discussed in Chapter 7.

#### *6.2.5.1 Cloze Test*

Table 1a provides a summary table of the mean gains and standard deviations for the children's performance on the cloze test. It was hypothesised that to perform well in cloze tests, readers would benefit from the application of metacomprehension strategies. It was therefore predicted that the gain scores for the children in the experimental group, who received the metacomprehension training, should be significantly greater than that of the control group. It was also expected that the below average experimental group would benefit more from the metacomprehension training. An inspection of the data presented in Table 1a, over leaf, suggests that the below average experimental group may indeed have benefited more from the intervention, demonstrating a mean gain of 10.2 months in an intervention period of 1.4 months.

## Table 1a: Mean Gains and standard deviations for Cloze test measure

| Group | Mean | sd |
|---|---|---|
| EA | -3.4 mths | 12.9 mths |
| EB | 10.2 mths | 8.1 mths |
| CA | -8.5 mths | 7.8 mths |
| CB | -2.3 mths | 6.6 mths |

**KEY**

E = Experimental
C = Control
A = above average readers
B = below average readers

To test the observation that the below average experimental group may have benefited more from intervention for statistical significance a 2x2 ANOVA was computed (E/C vs A/B); the results of which are summarised in Table 1b.

## Table 1b: Summary ANOVA table for cloze test measure using gain score

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| | | | | | |
| E/C | 1 | 1161.6 | 1161.6 | 13.844 | <0.001 |
| A/B | 1 | 1480 | 1480 | 17.64 | <0.001 |
| E/C*A/B | 1 | 201.66 | 201.66 | 2.404 | NS |
| Remainder | 56 | 6639.9 | 83.905 | | |
| | | | | | |
| Total | 59 | 7542 | | | |

**KEY**

E = Experimental: C = Control :A = above average readers: B = below average readers

## Means for Table 1b

**Experimental/Control**
Experimental Group: **3.4mths**
Control Group: **-5.4 mths**

**Above/Below Average readers**
Above average: **-5.9667mths**
Below average: **3.9667mths**

**Interaction**
Experimental/Above average: **-3.4mths**
Experimental/Below average: **10.22mths**
Control/Above average: **-8.5333mths**
Control/Below average: **-2.2667mths**

From the above tables it can be seen that the two main effects (E/C, and A/B) were highly significant ($p<0.001$; (E/C: $F(1,59)= 13.844$; A/B: $F(1,59)=17.64$), whilst the interaction was insignificant, indicating an overall effect for the experimental children, but not when they are divided into above and below average readers, and compared with their matched controls.

From the table of means accompanying table 1b it can be seen that the average mean gain for the experimental group was 3.4 months, resulting from an intervention period of 1.4 months.

### *6.2.5.2 Comprehension Measure*

The children were asked pre- and post- intervention to answer 5 literal and 5 inferential questions about a passage they had just read. They were given a score of 1 for each question answered correctly. The maximum score obtainable was therefore 10. Since the study was concerned with changes in performance between Experimental and Control groups, gain scores were used in the analysis. Table 2a presents the mean gain scores for each condition and question type. An average score of 1 indicates that the children answered, on average, 1 more question post- intervention; an average score of 0, that there was no change in performance.

**Table 2a: Mean gains and standard deviations for comprehension measure**

| Group | | Literal | Inferential |
|---|---|---|---|
| EA | Mean | 1.4 | 2.3 |
| | *sd* | *1.2* | *1.4* |
| EB | Mean | 1.3 | 1.8 |
| | *sd* | *1.1* | *1.5* |
| CA | Mean | 1.3 | 1.5 |
| | *sd* | *0.7* | *1.6* |
| CB | Mean | 1.6 | 1.3 |
| | *sd* | *1.4* | *1.1* |

**Key**

E=Experimental
C=Control
A=Above average readers
B=Below average readers

From the original hypotheses set out in Section 6.2.2.3 one might expect the following results from intervention:

I. within the experimental group both the above and below average readers should demonstrate significant gains in their ability to answer inferential, as compared with literal questions. Such gains should be greatest for the experimental below average readers

II. differences should be found between the experimental and control groups. Thus, the experimental children should demonstrate greater gains than the control children in their ability to answer *both* literal and inferential questions. The effect should however, be greatest for inferential questions since it was predicted that the intervention should have its greatest impact on children's ability to answer inferential questions. It was also predicted that any between group differences should be greater for the below average readers.

An inspection of the means shown in table 2a suggests that the data are in

the expected direction for the within group change described in i) above, namely that the mean gains for both the above and below average readers in the experimental group is greater for the inferential questions than the literal questions. Contrary to i) above, such gains appear to be greater for the above average readers than the below average readers (i.e., mean gain for E*A*I = 2.3; mean gain for E*B*I = 1.8).

As predicted in ii) above, the mean gains for the experimental as compared with the control group children appear to be greatest for inferential questions; however the biggest difference appears to be between the experimental above average readers and the control above average readers (i.e., E*A*I = 2.3 and C*A*I = 1.5 corresponding to a mean gain difference of 0.8 questions).

To determine whether or not the above observations were statistically significant a 2*2*2 (E/C X A/B X L/I) ANOVA was computed. The results are shown in Table 2b over leaf with the means and standard deviations in Table 2c. No significant differences were obtained indicating that although the mean gains presented in table 2a suggested that the data were in the predicted direction for the alternative hypotheses, the changes in performance were not sufficient to reject the null hypotheses.

## Table 2b: ANOVA table for comprehension measure using gain scores

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| Between Ss | | | | | |
| E/C | 1 | 2.408 | 2.408 | 1.37 | NS |
| A/B | 1 | 0.208 | 0.208 | 0.118 | NS |
| E/C*A/B | 1 | 1.008 | 1.008 | 0.573 | NS |
| Ss Within Gp | 56 | 98.467 | 1.758 | | |
| | | | | | |
| Within Ss | | | | | |
| L/I | 1 | 3.008 | 3.008 | 1.928 | NS |
| E/C*L/I | 1 | 3.675 | 3.675 | 2.355 | NS |
| A/B*L/I | 1 | 1.408 | 1.408 | 0.902 | NS |
| E/C*A/B*L/I | 1 | 0.008 | 0.008 | 0.005 | NS |
| BxSsWithin Gp | 56 | 87.4 | 1.561 | | |
| | | | | | |
| Total | 59 | 197592 | | | |

## Key

**E**=Experimental group: **C**= Control group
**A**= Above average readers: **B**= Below average readers
**L**= literal questions: **I**= inferential

## Table 2c: Means for comprehension ANOVA

| Source | Group | Mean |
|---|---|---|
| E/C | E | 1.7 |
| | C | 1.41 |
| A/B | A | 1.6 |
| | B | 1.52 |
| L/I | L | 1.4 |
| | I | 1.72 |
| E/C*A/B | E/A | 1.83 |
| | E/B | 1.57 |
| | C/A | 1.37 |
| | C/B | 1.47 |
| E/C*L/I | E/L | 1.37 |
| | E/I | 2.03 |
| | C/L | 1.43 |
| | C/I | 1.4 |
| A/B*L/I | A/L | 1.33 |
| | A/I | 1.87 |
| | B/L | 1.47 |
| | B/I | 1.57 |
| E/C*A/B*L/I | E/A/L | 1.4 |
| | E/A/I | 2.27 |
| | E/B/L | 1.33 |
| | E/B/I | 1.8 |
| | C/A/L | 1.27 |
| | C/A/I | 1.47 |
| | C/B/L | 1.6 |

## Key

**E**= Experimental group: **C**= Control group
**A**= Above average readers: **B**= Below average readers
**L**= Literal questions: **I**= Inferential questions

#### *6.2.5.3 Self- Generating Measure.*

The children were asked to read a passage and then to pretend to be the teacher and ask the experimenter questions related to the story. A record was made of the *total* number of questions asked, together with the number of questions generated under each of the following three categories: textually explicit (literal form), and textually and scriptally implicit forms (inferential). As in the previous two measures gain scores were used, indicating changes in performance as a result of intervention. A mean of 1 indicates that the children generated, on average, 1 extra question post-intervention; a mean score of 0 indicates that no change in performance occurred. The results for this dependent variable will be looked at, firstly in terms of the total number of questions generated irrespective of question type, and then by the number of textually explicit, and textually and scriptally implicit questions generated. Only those comparisons relevant to the hypotheses will be considered.

##### *6.2.5.3.1 Total number of questions generated*

In relation to the total amount of questions generated, it was hypothesised in Section 6.2.2.1 that if the metacomprehension intervention was effective then it might be expected that the children in the experimental group would generate more questions post- intervention than those children in the control group, and that the effect should be greatest for the experimental below average group. Such an effect would be demonstrated by significantly bigger mean gain scores for the experimental group children. Table 3a provides the mean gains and standard deviations for the total number of questions generated.

**Table 3a: Mean gains and standard deviations for total number of questions generated**

| Group | Mean | sd |
|---|---|---|
| EA | 5.2 | *3.8* |
| EB | 4.1 | *3.6* |
| CA | 0.3 | *4* |
| CB | 0.2 | *1.9* |

**Key**

E= Experimental group
C= Control group
A= Above average readers
B= Below average readers

The mean gain scores shown in table 3a would seem to suggest that there were greater benefits for the experimental children who received the metacomprehension intervention as compared with the control children who did not. The difference between the experimental above and below average readers appears to be contrary to what was predicted: the above average group making greater gains than the below average group.

To test whether or not the above observations were significant, a series of planned comparisons were computed using the Mann Whitney U test (adjusted for ties) the results of which are shown in table 3b below.

**Table 3b: Mann Whitney U results for total number of questions generated.**

| Comparison | Observed U | Tabled U | p 1-tailed |
|---|---|---|---|
| EA vs EB | 98 | 72 | NS |
| EA vs CA | 41.5 | 56 | p<0.01 |
| EB vs CB | 41 | 56 | p<0.01 |
| CA vs CB | 102.5 | 72 | NS |

**Key**

E = Experimental: C= Control

A= Above average readers: B= Below average readers

As predicted from the mean gains shown in table 2a, highly significant results were obtained for those comparisons comparing the experimental with the control groups ($p<0.01$, 1-tailed). The above and below average experimental group readers were not significantly different from one another (e.g., EA*EB=NS). Such results would suggest that the metacomprehension programme was effective in terms of improving children's ability to generate questions, but did not seem to have a differential effect for above and below average readers.

#### *6.2.5.3.2 Analysis of data by question category*

Perhaps the most interesting results from the question generating measure because of their significance in relation to metacomprehension development, concerns the type of questions generated. It was hypothesised that positive changes in children's metacomprehension could be inferred from the category of question generated for self-interrogatory purposes. It was predicted that if the intervention programme in the present study was successful in improving children's metacomprehension, then this should be demonstrated by an increase in the generation of textually and scriptally implicit questions. Such questions demonstrate a deeper analysis of text, suggesting the application of more advanced metacomprehension strategies and subsequent comprehension. It would therefore, be expected that the experimental children's mean gain scores for textually and scriptally implicit questions should be significantly greater than those of the control children's, and such gains should be greatest for the below average readers, whom it was hypothesised are most likely to benefit from metacomprehension instruction. The mean gain scores for each of the three question categories are shown in table 3c.

**Table 3c: Mean gains and standard deviations for textually explicit, and textually, and scriptally implicit questions.**

| Group | TE | TI | SI |
|---|---|---|---|
| EA | 3.9 (3) | 2 (3) | -0.4 (1.2) |
| EB | 1.7 (2.9) | 2.1 (2.2) | 0.3 (0.5) |
| CA | 0.9 (2.5) | 0.6 (2.6) | 0 (0.5) |
| CB | 0.1 (1.6) | 0.3 (1.9) | 0.1 (0.8) |

**Key**

**E**=Experimental **C**=Control
**A**=above average readers: **B**=below average readers
**TE**=textually explicit **TI**= textually implicit **SI**=scriptally implicit
( )=sd

The mean gain scores shown above suggest that there may be significant between group differences as predicted, for textually explicit and implicit questions but not for scriptally implicit questions. Thus, the experimental children appear to have generated more textually explicit and implicit questions than the control group children, post- intervention. The above and below average readers in the experimental group have similar mean gains for textually implicit questions but not for textually explicit questions (i.e., E*A*TI=2, and E*B*TI= 2.1; E*A*TE=3.9, and E*B*TE=1.7).

To test the above observations for statistical significance, 6 planned comparisons using the Mann Whitney U test (corrected for ties) were computed. The 6 planned comparisons represent the between group differences which were of most interest to the present study, providing information about whether the experimental groups of children were significantly better than their matched controls in generating textually explicit, and textually, and scriptally implicit questions. The results are shown in table 3d.

**Table 3d: Mann-Whitney U test results for between group differences**

| Comparison | U* | Z | p* |
|---|---|---|---|
| E*A*SI / C*A*SI | 97.5 | -0.622 | NS |
| E*B*SI / C*B*SI | 94 | -0.27 | NS |
| E*A*TE / C*A*TE | 45.5 | -2.78 | p<0.01 |
| E*B*TE / C*B*TE | 61.5 | -2.12 | p<0.05 |
| E*A*TI / C*A*TI | 61.5 | -2.12 | p<0.01 |
| E*B*TI / C*B*TI | 61 | -2.14 | p<0.01 |

**Key**
E= Experimental
C= Control
A= Above average readers
B= Below average readers
TE= Textually explicit questions
TI= Textually implicit questions
SI= Scriptally implicit questions
p* 1-tailed
U* (N=15)

From table 3d it can be seen that the experimental children in the above and below average groups made significantly greater gains in generating textually explicit and implicit questions, than their matched control groups ($p<0.05$ and $p<0.01$). There were no significant differences for scriptally implicit questions.

The above results are in accordance with the observations made from the table of mean gains, and partially confirm the predictions made at the outset of the research, namely that if the metacomprehension programme was effective, then this should be reflected in the quality of questions generated; children in the experimental group being able to generate more textually and scriptally implicit questions than their matched controls, post-intervention. The possible reasons for not effecting any significant changes in performance for scriptally implicit questions are discussed in Chapter 7.

In addition to the above between group differences, it was also predicted that if the metacomprehension programme was effective then the experimental below average readers should demonstrate significantly greater changes in question generation for each of the three question categories, than the experimental above average readers. To test the above hypotheses for statistical significance, a further 3 planned comparisons were computed using the Mann-Whitney U test (corrected for ties) and are shown in table 3e.

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classes and therefore across the three teachers. Of interest therefore, are the comments made by the teachers about the exercises in the programme, in terms of content and appropriateness rather than how it was delivered since this was prescribed and constrained by the prescriptive nature of the teacher's handbook. In addition the children's reaction to the programme was interesting particularly given the effects of motivation on learning (e.g., Covington, 1992; Kurtz-Costes, Ehrlich, McCall, and Loridant, 1995). Thus, did they find it interesting and did they relate to the character, Mr. Homunculus the Reading Detective?

The following provides a qualitative description of teacher and pupil comments to the 6 week programme. The information in relation to the teachers' perceptions was obtained from informal discussions between the teachers and researcher half way through, and at the end of the programme. The children were interviewed informally at the end of the programme. Given that no formal standardised interview format was used the comments can only be regarded as general perceptions and are therefore, of an anecdotal nature.

#### *6.2.5.4.2 Teacher Comments*

***A. Programme Content***

- all teachers found the self-regulatory exercises in Part 1 difficult for the children to grasp

- all commented on the need to highlight for the children when an error had been made in Exercise 2. The preferred mode for doing this was to alter tone of voice and pace of reading when approaching a deliberate error.

- all teachers would have liked to practice the error detection exercises more, particularly for the less able readers. More differentiation and practice was required.

- all of the teachers were surprised at how important the first two monitoring exercises were and would have taken more time over

these if they had not been constrained by the programme

- all teachers felt that they would have liked to introduce the self-regulatory exercises at P3, and build on this learning through to P4

- 2 of the three teachers suggested that when the programme shifted the emphasis from Mr. Homunculus the self-monitor (Part 1) to Mr. Homunculus the detective (Part 2), it would have been helpful to have inserted prompts in the remaining exercises to remind children of the essential role of Mr Homunculus the self-monitor.

- all of the teachers found the teaching of 'what' 'where' 'when' 'why' and 'how' questions easy because it was familiar to them. Using it as a stepping stone to get children to formulate similar questions for themselves whilst reading was reported as being new.

- all of the teachers felt that they were having to rush the last four exercises in order to finish the programme on time. Greater differentiation would have eased the difficulties.

- all found the self-generation of questions a useful teaching exercise and expressed surprise that the children were able to do it.

***B. Impact on teaching and learning***

- the emphasis on making thinking processes explicit to children was felt by all teachers to be a different and important refocusing for their teaching practice.

- all said they would use reciprocal teaching in other curricula areas.

- two teachers swapped novels and the accompanying Mr.Homunculus programme to use with next year's class

- all teachers provided staff development for teachers in their own school demonstrating their commitment to the programme

- all teachers felt that the choice of novel was important but not essential. The Mr. Homunculus exercises and the general approach were regarded as the important variables

- all teachers indicated that there was no need to run a mainstream reading scheme along side Mr. Homunculus.

- all felt that the children were beginning to deploy strategies in other areas of the curriculum. One teacher provided an example from a child's mathematics jotter. She felt that the child had demonstrated greater accuracy than was previously apparent in his work because he had read the problem 'more carefully'.

- all of the teachers felt that the less able readers lacked confidence in formulating Thinking, Given and Me (see Chapter 5) questions and did not feel that they used the activity as a self-interrogatory strategy

#### *6.2.5.4.3 Children's comments*

- all of the children indicated that they had enjoyed working with Mr. Homunculus.

- the letters produced in Exercise 12 indicated a firm grasp of the early exercises and the use of Mr. Homunculus as a self-monitor (e.g., Appendix 6)

- all of the children were able to describe to the examiner who Mr. Homunculus was and how he related to the language curriculum

- all of the children could provide a summary of the novel they had been reading

- when post- testing the children some of them commented verbally that they would use Mr. Homunculus to help them.

# Chapter 7: Discussion

## 7.1 Introduction: How effective was metacomprehension intervention?

The aims of the main study were to determine whether or not children could be taught metacomprehension strategies by teachers, and if there were differential effects for good and poor readers. The underlying premises, supported by the pilot study, were that children are not currently being taught metacomprehension strategies, and that these strategies are important if children are to become independent comprehenders of text. It was suggested in the introductory chapters that to achieve many of the reading comprehension targets outlined in the 5-14 English Language Curriculum Guidelines, children would benefit from being taught metacomprehension strategies. It was also argued that the novel, if used appropriately could be a well suited vehicle for introducing metacomprehension strategies. The novel was used to provide the text material and learning context for the metacomprehension programme used in the present study, and entitled "Mr. Homunculus the Reading Detective". It was expected that children receiving the metacomprehension programme would perform significantly better than a matched control group on the three metacomprehension measures discussed previously, namely, cloze, comprehension, and question generating tests. It was also predicted that the intervention would have differential effects on good and poor readers, with the poor readers demonstrating the greatest benefits.

The results from the study were generally encouraging, significant effects being demonstrated for both the cloze and question generating measures, indicating that the metacomprehension programme had been successful in achieving some of the stated aims. Such results contrast with those obtained in the pilot study, where none of the main effects were significant. It is disappointing that significant effects were not obtained on the comprehension measure, particularly since it might be argued that ability to answer questions is the very outcome which teachers would wish to achieve as a result of intervention. What, it might be asked, is the point of teaching children metacomprehension strategies if these do not improve

their ability to answer questions? Such a view of comprehension instruction is perhaps narrow and limiting; however it is an issue which will be returned to later.

The following sections will look at the results obtained from each of the three dependent variables, cloze, comprehension and question generating measures, and will discuss the possible interpretations which may be made of the data outlined in Chapter 6. The final section attempts to summarise the main findings and provide a model of metacomprehension development inferred from the data obtained in the main study.

Before proceeding with the discussion outlined above, it is important to draw the readers' attention to the following methodological point related to the size of the sample used and the implications of this for the generalisation of the results. It is normally accepted that a random, or 'probability' sample (viz., Robson 1993), such as that used in the present study, allows the researcher to generalise results to similar samples found within the general population. However, the relatively small number of children represented in the current sample makes such generalisations less robust. As such the reader is encouraged to regard the foregoing discussion cautiously when applying the results to all children.

## 7.2 Discussion and interpretation of results

### 7.2.1 The cloze test

The cloze test results indicated significant gains in performance as a result of intervention for the experimental group of children. More specifically, the experimental group obtained mean gains of 3.4 months, whilst the control group deteriorated by an average of -5.4 months, post-intervention. The interactions were insignificant indicating that there were no statistically significant gains made by the experimental or control, above or below average readers. Firstly, the results suggest that the intervention programme had been successful in teaching children metacomprehension strategies, but is there anything more which the cloze test results can say about children's metacomprehension performance? For instance, is it possible to determine from the cloze test which parts of the

metacomprehension programme were instrumental in achieving such positive gains? What exactly does the cloze test indicate in relation to the children's metacomprehension development in the present study? Secondly, whilst the results were significant for the experimental group, why did the control group apparently get worse after the research phase? Thirdly, does a gain of 3.4 months have any real meaning for the practitioner, i.e., is it a sufficient gain to justify a training programme? Each of these points will be debated in the following paragraphs.

#### *7.2.1.1 What do gains in cloze procedure indicate?*

In order to perform well in a cloze test, children need to apply self-monitoring strategies such as those taught in Part 1 of the metacomprehension programme. They have to monitor and regulate their on-going reading behaviour, activating appropriate remedial strategies such as re-reading, reading-on, and re-capping when failures to understand are detected as a result of the feed-back from self-monitoring. Given that these strategies were specifically taught in Exercises 1 to 4 of the metacomprehension programme, it might be assumed that the mean gains in performance obtained by the experimental group in the cloze test, resulted from the instructional content of the above exercises. The idea of a little man in the head, monitoring and revising one's reading behaviour, appears therefore to have had a significant influence on the children. Further anecdotal evidence would support such a conclusion. For example, one child referred to Mr. Homunculus as *"the little man in yer heid who talks to you"*, and another as: *"Oh, he's the man that talks in your head, but your lips don't move"*. When asked about what the poster displays around the classroom walls represented, one child replied: *"that's Mr. H' telling you what to do when you get stuck"*. The children appeared to relate to Mr. Homunculus, and from their comments were aware of an inner self-monitoring voice (see section 6.2.5.4.3).

Being aware of one's self-regulatory behaviour does not necessarily mean that one will implement appropriate metacomprehension strategies when understanding is noted as failing. Such behaviour depends on having conditional knowledge, that is, knowing when and why to apply one's metacomprehension knowledge of strategies (Paris, Lipson and Wixson

1983). However, the fact that children in the experimental groups were significantly better than the control groups at cloze procedure post-intervention, indicates that not only were they more aware of self-monitoring, but they were also deploying more effective remedial strategies, since to perform well in cloze procedure the children would have to have used the strategies of reading on and back in the sentence/text, and re-capping, all strategies taught in Exercises 3 and 4, and necessary for metacomprehension.

The quantitative data obtained from the cloze test, together with the anecdotal evidence described above and in section 6.2.5.4.2 would tend to suggest that the metacomprehension exercises at the beginning of the programme had a positive effect on children's ability to self-monitor and apply appropriate remedial strategies. The cloze test results therefore tend to support the value of the initial exercises (i.e., Exercises 1 to 4) in the metacomprehension programme, suggesting that children can be taught to self-monitor and apply remedial reading strategies in order to achieve the aim of keeping track of what they are reading. Such behaviour may be regarded as an early stage of metacomprehension development, and it could be argued, is a prerequisite for more advanced metacomprehension behaviour necessary for improving inferential comprehension. The stages of metacomprehension development and their possible implications for reading comprehension will be returned to later in the concluding section of this chapter.

Interestingly, the teachers reported that the self-monitoring activities covered in Exercises 1 to 4 (e.g., stopping and starting in the text and asking the inner question "Do I understand?", spotting misprints and reading on and back in the text), were very difficult for the children but despite such problems, significant gains were achieved. The problems expressed by the teachers about the difficulties of instructing children to be aware of their misunderstandings through the process of self-regulation is consistent with previous research, indicating that children have major problems in identifying misprints in text even when they are told to look for errors (Markman 1977; 1979; Oakhill 1995). Such behaviour is generally accepted as indicating a lack of self-regulatory behaviour, rather than

factors such as poor working memory, or reluctance to identify errors. If the cloze test measures children's self-regulatory behaviour together with the application of appropriate remedial reading strategies such as reading back and on in the text, and given the problems children have in acquiring such strategies, then the improvements achieved by the teachers through the use of the metacomprehension programme might be regarded as commendable. However, it is possible that because of the difficulties experienced by the children in achieving the aims of the first four exercises, the teachers spent more time reinforcing them. This could have resulted in less time being spent on the later exercises which were more related to question answering, thereby accounting for the significant results obtained from the cloze test as compared with the comprehension test. Such a possibility does not detract from the results and arguments made in relation to the cloze test, but perhaps have something to say about the duration and content of future metacomprehension programmes. Perhaps, more exercises would be required at each stage of the programme to ensure mastery of each of the aims.

#### *7.2.1.2 Why did the control group appear to get worse after intervention?*

The above discussion has been based on the premise that there were statistically significant gains made by the experimental group as compared with the control group on the cloze test. However, an inspection of the results indicates that the experimental group increased their performance by 3.4 mths, whilst the control group actually got worse, their score going down by an average of 5.4 mths. Two possible explanations for such a decrease in performance are:

I. the 'parallel' tests used for pre- and post- assessment were not equivalent, and that the post-test was harder, resulting in reduced performance for those children in the control group, or
II. the control group were unusually weak thereby making the experimental children appear better

It is difficult to find a defence for point II) given that the children were matched in terms of reading performance pre-intervention, and that each

group had the same test pre- and post- intervention, and were therefore subject to the same vagaries of test difficulty. A stronger argument could be made in defence of point I., that is, that the tests were not equivalent, the post-test being harder than the pre-test. The fact that the children in the experimental group demonstrated mean gains in what appeared as a more difficult post-test might indicate that they were less affected by the discrepancy in test difficulty because they had learned appropriate metacomprehension strategies which enabled them to overcome the increased reading difficulty experienced by the control groups who did not have the strategy training.

In retrospect, the test re-test problems could have been overcome by splitting both groups so that half of each of the experimental and control groups were given test A and B in the pre-test condition, and the opposite form in the post-test phase.

#### *7.2.1.3 Is a mean gain of 3.4 months meaningful?*

If one accepts that the metacomprehension programme produced significant results for the children in the experimental group, one might question whether an average gain of 3.4 mths is meaningful in a real life situation. It may be statistically significant, but what does it actually mean to children and practitioners? Certainly, such a gain is more than twice the duration of the intervention programme, indicating that in 1.4 mths, the children in the experimental group increased their standard reading age, as measured by the Gapadol (McLeod and Anderson 1973), by a mean of 3.4 mths, post-intervention. In real terms this might be regarded as a modest increase, but it is a gain achieved after a short period of intervention which covered a wide variety of metacomprehension strategies. It may be argued that had the programme spent the entire time teaching the self-monitoring and associated remedial strategies (i.e., re-reading, reading on and summarising) introduced in the first four exercises, then gains in the cloze test would have been greater. When consideration is given to the amount of new learning presented in the programme over the six week period, a 2 month gain in cloze performance might be regarded positively by practitioners indicating that it is possible to teach children to self-monitor and subsequently to implement appropriate remedial strategies.

#### *7.2.1.4 Summary*

The balance of evidence obtained from the cloze test results would seem to suggest that metacomprehension instruction which emphasises the self-regulatory aspects of reading have a positive effect on children's ability to read for meaning. Cloze procedure was not directly taught by the intervention programme, performance being dependent on the children making their own connections between the early exercises of stopping and starting, and reading on and back in the text, to the related activity of filling in missing words in a sentence. The results from the cloze test may therefore be regarded as encouraging evidence for the ability to teach children self-monitoring behaviours which they can then *choose* to use in similar but not identical reading activities, thereby demonstrating strategic, metacomprehension behaviour.

### 7.2.2 Comprehension Measure

It is assumed that if children are applying appropriate cognitive and metacomprehension skills and strategies whilst reading, their comprehension should improve. In particular, if appropriate metacomprehension strategies are being applied, then children's ability to answer inferential, as compared with literal questions, should be better.

The argument being proposed is that to infer requires more careful analysis of text, combining main ideas across sentences and paragraphs, which in turn invokes the use of self-monitoring behaviour and strategies such as stopping and starting, reading on and back through the text, and generating self-interrogative questions. It would be expected therefore, that the children who received metacomprehension training would demonstrate better inferential question answering than those children not receiving training.

The results show that there were no statistically significant main effects, indicating that the children in the experimental and control groups did not differ significantly in the number of literal or inferential questions which they were able to answer post-intervention ($p>0.05$ $F(1,59)=2.355$). The results also show that there were no differences between above and below

average readers either within or between groups. Thus, the above and below average readers in the experimental group did not differ significantly from one another as was predicted, and there were no significant differences between experimental and control, above or below average readers.

As stated previously in Chapter 6, it was expected that, if the metacomprehension programme was effective, the children in the experimental group should be better able to answer inferential questions post-intervention. If this is the case then the mean gain scores for inferential questions should be greater for the experimental than for the control groups, and within the experimental group, the mean gains for inferential questions should be greater than for literal questions. Although the results were non-significant, an inspection of the mean gain scores shown in Table 2c suggested that they were in the direction of the expected effects described above. Thus, the experimental children achieved mean gains of 2.03 inferential questions, compared with the control group which made average gains of 1.4 inferential questions, post-intervention. Given that there were only 5 inferential questions, a gain of 2.03 represents a 46% increase in performance, as compared with 30%, for the control group. Within group differences were also greater for the experimental than the control group. For the experimental group, mean pre- to post-test gain in ability to answer literal questions was 1.4, compared with a gain of 2 for inferential questions; for the control group the mean gain was 1.4 for literal and inferential questions.

However, the fact remains that the above comparisons failed to reach statistical significance. There are a number of possible explanations for the failure to effect significant change in children's comprehension scores:

I. the sample size was too small
II. there were too few questions to differentiate clearly between groups
III. a comprehension test is not sufficiently sensitive to measure subtle changes in metacomprehension
IV. the intervention period was not long enough to allow the independent application of the metacomprehension strategies being taught

V. the acquisition of metacomprehension strategies does not necessarily improve comprehension

VI. children did not learn metacomprehension strategies from the programme, or those which they did learn, were not helpful in improving inferential comprehension.

VII. a delayed, rather than immediate post-test would be required to detect changes in performance

Issues I) to III) are related to methodology and when contrasted with similar previous research, do not provide satisfactory explanations for the lack of effect. Points IV, V, and VI relate to the theoretical model which one might proffer in relation to metacomprehension development and the possible effects of such development on the understanding of text. Finally, point VII is a methodological issue, but also relates to points IV, V, and VI, and as such will be returned to at the end of this section.

What follows is a more detailed discussion of the points noted above, leading the reader towards a possible model of metacomprehension development, which is elaborated in section 7.3.

#### *7.2.2.1 Sample size and number of questions*

In relation to sample size, there are a number of examples of metacomprehension training studies in the research literature in which more subjects have been used than in the present study, but despite this have failed to effect significant change in comprehension scores. The converse is also true, fewer subjects have been used and significant changes in comprehension scores have been achieved. For example, Paris Cross and Lipson (1984) had a sample size of 180 children, but failed to achieve significant change in comprehension performance as measured by two norm-referenced comprehension tests. Subsequent studies with larger samples of 1000 children also failed to achieve significant change in comprehension scores (Paris and Oka 1986). As noted in Chapter 1 Paris, argued that the use of standardised comprehension tests were insensitive to changes in metacomprehension development because they were designed to differentiate performance according to ability. Individuals' intellectual aptitude would therefore determine performance, rather than

metacomprehension abilities. In effect, the suggestion being made is that norm-referenced comprehension tests are either inappropriate or insensitive measures of metacomprehension.

It was for this reason that the present study decided not to use a norm-referenced comprehension test but instead devised a comprehension measure based on the earlier work of Hansen and Pearson (1983). They effected significant change in children's inferential comprehension with a sample size of 40, as measured by a comprehension test produced by themselves comprising 3 literal and 3 inferential questions. With a smaller sample and fewer questions, they were able to show gains in achievement. Given that the present study had more subjects and used a comprehension measure similar to that deployed by Hansen and Pearson but with more literal and inferential questions, it might be argued that points I) and II) (i.e., sample size and number of questions used to measure change in comprehension) are not sufficient to explain the apparent failure to achieve significant gains in children's inferential comprehension.

Is it possible then that comprehension tests are insensitive measures of change in metacomprehension (i.e., point III)? The focus of Hansen and Pearson's study was to teach children how to answer inferential questions. Their main assessment aim was therefore, to measure changes in inferential comprehension as a result of intervention, rather than changes in metacomprehension. This may account for their comprehension measures' success in detecting change, since the 'change' being measured was in comprehension rather than metacomprehension. This contrasts with the present study and those by Paris et al which attempted to use comprehension tests as a measure of metacomprehension, the assumption being that improvements in metacomprehension could be inferred from positive changes in inferential comprehension (see section 1.8.2.3 for fuller discussion of comprehension measures).

It is possible then, that Paris and his colleagues were correct in hypothesising that comprehension tests are insensitive to changes in metacomprehension. What seems to be misleading in their argument is that standardised comprehension tests were at fault because of their

correlation with cognitive ability. The present study used a criterion referenced test based on Hansen and Pearson's study and still failed to detect change in metacomprehension. Perhaps all comprehension measures are inadequate as measures of change in metacomprehension and what is required are more direct assessments of metacomprehension . Thus, if one wants to assess metacomprehension one should measure these specific strategies (e.g., ability to self-monitor), rather than trying to infer acquisition from what one believes to be the product: in this case, improved inferential comprehension. However, it does not seem reasonable to suggest that changes in metacomprehension development cannot be inferred from the results of comprehension tests if one believes that comprehension is influenced by one's metacomprehension abilities. It is difficult to argue otherwise given the empirical evidence reviewed in the introduction (e.g., Moore 1982; Myers and Paris 1978). Additionally, similar arguments could have been made in relation to the cloze test measure, since performance on a cloze test also infers the application of metacomprehension strategies. What then would account for the apparent failure of children to improve their inferential comprehension skills in the present study? To answer this question one needs to enter the debate posed previously by points IV, V, and VI, namely that the intervention period was not long enough, that the acquisition of metacomprehension strategies does not necessarily improve comprehension, that children did not learn metacomprehension strategies, or those they did learn were not helpful in improving inferential comprehension answering abilities.

#### *7.2.2.2 What did metacomprehension intervention achieve, and why did it not effect changes in inferential comprehension?*

Before being able to answer other peoples' questions, children have to acquire a number of cognitive skills and metacomprehension strategies, at the declarative (knowing **what**), procedural (knowing **how**) and conditional (knowing **when** and **why**) levels. The intervention programme used in the present study attempted to lead children through a hierarchy of skill development designed to improve their understanding. They were first taught that reading involves self-monitoring, and were given procedures to use in conjunction with such regulatory behaviour (e.g., reading on and back through the text). Having acquired these early metacomprehension

strategies, as suggested by the cloze test results, they were provided with more sophisticated self-interrogative strategies involving the formulation of their own questions. The function of question generating was to provide the children with a means of evaluating their understanding of a text whilst they were reading. The questions were therefore intended to be in the form of 'mind questions', that is, questions which would be thought about whilst reading, and in relation to on-going monitoring of the general meaning of the text. To encourage different levels of interpretation, the children were taught to generate different types of questions, namely, textually explicit (known to the children as **'Given'** questions), textually implicit (**'Thinking'** questions ) and scriptally implicit (**'Me'** questions) forms. They were then taught the relationship between questions and answers, and how this could be used to answer questions. For example, the answer to a textually implicit question will not be found easily in the text and will require the synthesis of information from different parts of the text. The assumption being made during this teaching process was that being able to pose one's own questions would help in answering the questions of others. However,it is possible that the children learned to generate questions of varying sophistication as a means of monitoring their *own* understanding (as indicated by the results from the Question Generating measure and discussed in more detail in the next section), but were unable to use such skills to answer the questions of others. Anecdotal evidence together with the contrasting results obtained from the question generating and comprehension measures (i.e., there were significant post- intervention gains in the former but not the latter), suggests that the children may have appreciated the varying complexity of different question types and the consequent ease or difficulty of finding an answer, but were unable to use such information to help them to answer others' questions. In other words, they had acquired declarative/task knowledge but not procedural or conditional knowledge. This point is exemplified by one child who, on being asked to pretend to be the teacher and ask the researcher questions said: *"I am going to ask you a 'thinking' question now"*. From the tone of voice it was evident that he knew a 'Thinking' question was harder to answer than his previously generated 'Given' (textually explicit) questions. The child had therefore acquired knowledge about the different types of questions one could ask, knew something of the relationship between

questions and answers (i.e., that a difficult question usually has a difficult to find answer), and could generate each of the question categories.

It might be surmised from the lack of significant gains on comprehension test results, that the children were unable to use the knowledge described above to answer the questions of others. Thus, while children may have gained declarative/task knowledge about **what** questions to ask they did not seem to know **why** they were being taught to identify and ask different questions, or **when** they should use such strategies (conditional knowledge). The children failed to operate at a conditional level. They may also have been deficient in procedural/strategy knowledge, that is, **how** to find answers to inferential questions, since the programme only provided practice in answering such questions in one exercise.

To improve inferential answering abilities children may require more information and practice in looking for appropriate clues to answer such questions. It is not enough to simply identify question type, and on the basis of such information to know that, for instance, a textually implicit question will need careful consideration, and searching in the text, to find an answer. Children also need to know where to hunt, and what to look for. In the present programme more modelling and scaffolding on the part of the teacher would be required in order to help children acquire sufficient procedural/strategy and conditional knowledge to answer inferential questions.

To return to the original question of why children's inferential answering ability did not appear to improve as a result of intervention, it may be argued that they lacked appropriate procedural/strategy and conditional knowledge. Such deficiencies may have resulted from the over-ambitious time scale of the programme. If question answering occurs at the end of a process involving the development of self-regulatory skills, then more time would be needed on specific inference training (i.e., procedures) to effect any change in comprehension. Thus, the programme did not fail to teach children metacomprehension strategies, but those strategies which were learned, for instance to self-monitor and to generate questions, were not sufficient to effect changes in inferential comprehension answering abilities

(point VI). It is proposed that to achieve this, the programme would need to focus more on teaching children procedures relevant to answering inferential questions (point V). This in turn would require a longer and perhaps more sustained intervention period (point IV).

The above hypotheses are given some credence by the positive results obtained for example, by Hansen and Pearson (1983), and Yuill and Oakhill (1988). Their research might be considered as examples of training programmes designed to focus on the procedural aspects of comprehension instruction, teaching children the cognitive skills necessary to improve their inferential comprehension of text. All of the instructional time was spent teaching children to look for key words, to identify important information chunks in sentences, and generally to use the structural and semantic clues in texts to answer inferential questions, all examples of cognitive skills. The emphasis of training is therefore different from the present study or those by Paris and his colleagues (e.g., Paris, Cross and Lipson 1984; Paris, Saarnio and Cross 1986) where the focus for instruction was on developing metacomprehension strategies, which emphasise the self-regulatory and organisation of knowledge(i.e., conditional) aspects of reading, rather than the procedures necessary for responding to questions posed by others. Perhaps then the acquisition of metacomprehension strategies was achieved at the expense of the development of appropriate cognitive skills. For positive gains to be made on inferential comprehension tests, instructional programmes probably need to achieve a balance between metacomprehension **strategy,** and cognitive **skills** training. Thus, children need to be given specific comprehension skills such as looking for key words in a question (i.e., cognitive skills), and be provided with information about when they might use such a skill, why it is helpful, and be encouraged to think about which other comprehension skills they might use if looking for key words is not successful (i.e., metacomprehension strategies).

#### *7.2.2.3 What comes first, cognitive skills or metacomprehension strategies?*

The above discussion raises an interesting debate about the onset of cognitive skills and metacomprehension strategies: which are acquired first

and how should they be taught? It may be argued that to teach children to answer questions, they first have to acquire metacomprehension strategies such as those involved in self-regulation and which are necessary to perform well on cloze procedure and question generation. The metacomprehension training therefore, needs to ***precede*** the cognitive skill training. Such a model is different from that originally postulated, since it was assumed that children first needed to acquire the cognitive skills, before the metacomprehension strategies. In practice for a child to function independently whilst reading it is likely that cognitive and metacognitive aspects of learning work fluidly together. However, it is important for teaching practice to have some idea as to the relative importance, and order of cognitive and metacomprehension attainment, since this will influence the presentation of the teaching programme. If metacognition precedes cognition in the answering of questions, then it might be assumed that instruction should first concentrate on teaching children self-interrogative strategies for self-monitoring purposes, before moving onto teaching specific cognitive skills necessary for answering inferential questions. Once children have mastered both skills and strategies, they may be able to combine the two to produce the 'big picture'. For example, by being taught to self-monitor and to generate questions whilst reading (as a form of self-assessment), the reader will be able to assess their level of understanding. If they find that understanding is failing (indicated perhaps by an inability to answer their own self-generated questions), then they may draw upon one of a range of possible comprehension skills to help remediate the problem. At this stage the reader is at the point of moving from the metacognitive to the cognitive. Thus, the reader may stop reading and decide to re-read a paragraph, or draw upon personal knowledge to help fill in the gaps in understanding, or look at the title to provide clues. All of the skills described are examples of cognitive skills, called into action as a result of the metacomprehension behaviour of the reader (i.e., self-monitoring and self-interrogation). In choosing to deploy one of the three possible tactics described, readers are deploying **conditional** knowledge, that is, they are organising their knowledge of task and strategies in order to facilitate the cognitive goal of answering others' questions (Garner 1990).

The point at which the reader makes a choice of which cognitive skill to use

to rectify their reading difficulty, might be regarded as the cognitive-metacomprehension transition point. The example highlights the seamless movement of the *competent* reader between metacomprehension and cognitive behaviour, and exemplifies the difficulty for the theoretician and practitioner in disentangling the cognitive from the metacognitive. The answer to the question: "What comes first, cognitive skills or metacomprehension strategies?" may depend on the point at which one's analysis of the reading process begins. In the example provided, the reader moved from the metacognitive to the cognitive and back to the metacognitive. The metacognitive aspects came first and last. What is perhaps important for the practitioner therefore, is to have a clear assessment of the cognitive skills and metacomprehension strategies required for successful completion of a comprehension task, and to ensure that the reader is furnished with both.

In the present study it could be argued that, to have effected significant changes in children's inferential comprehension, more emphasis would have been needed at the end of the training programme to teach children **how** to answer questions; in other words, those procedures necessary to answer inferential questions and similar to those deployed by Hansen and Pearson (1983) and Yuill and Oakhill (1988).

If, as has been postulated, the present metacomprehension programme failed to teach children sufficient procedural knowledge to enable them to better answer inferential questions, what did the programme achieve in relation to comprehension? To answer this question it is helpful to return to the issue of comprehension tests and what they measure. Such a discussion is dependent on what one considers to be 'comprehension'.

#### *7.2.2.4 Comprehension tests: 'sense' or 'meaning'?*

Inability to answer questions set by others, as is in the case of comprehension tests, does not necessarily indicate poor comprehension. It may be that the metacomprehension strategies taught in the present programme enabled children to obtain the main idea from a story, and to interpret those aspects of the text which interested or confused them, but failed to affect their question answering abilities. Gaining the main idea

from a passage would be dependent on readers monitoring their on-going reading behaviour, and questioning themselves at appropriate points in the passage. One might imagine the reader stopping and thinking the question *"I wonder why she did that?"*, or *"how is she going to explain that to Noddy?"*. Such self-interrogation may be used as a means of gaining a general understanding of the story, and to make inferences and predictions based on the reader's own agenda, but might not necessarily enable the reader to answer a specific question generated by another. The questions formed independently by readers will be dependent on what they perceive as significant and important in the story. The strategy is therefore personal, dependent on their self-assessment of their on-going thinking. Such behaviour is quite different from that required to answer specific questions. In this context the reader's behaviour is controlled by the question, and less by what the reader thinks is important. Who is to say that the questions chosen by an examiner to test understanding are significant to the individual interpretation made by a reader? Is it reasonable to say that because children have not answered a question correctly, they have not understood the passage? In effect the readers' metacomprehension behaviour is straight-jacketed by the need to answer another's question - a question which they may not have regarded as significant and therefore, in which they would not have detected the need to implement appropriate metacomprehension behaviour whilst they were reading independently.

Part of the difficulty in answering others' questions may therefore be related to one's view of the purpose of reading, and how one defines understanding. Vygotsky (1978) differentiates between *'meaning'* and *'sense'*. 'Meaning' is the socially acceptable form, it is how most people would interpret a given passage. 'Sense', however is personal, and is the understanding which the individual creates as a result of prior experiences. Similarly, Purves (1985), differentiates between *'meaning'*, which is shared with other readers and the writer, and *'significance'*, which is personal and divergent. Given such distinctions, it might be argued that comprehension tests measure 'meaning' rather than 'sense' or 'significance', since the questions posed are what are generally thought to be important. If this is the case, then one might question whether the measurement of 'meaning' is appropriate in a metacomprehension context, since such behaviour is

highly personal, goal directed, and dependent on the reader perceiving a purpose in the activity of gaining understanding (Paris, Lipson and Wixson 1983). Metacomprehension is perhaps best measured by assessing the 'sense' made of the story by the reader, or in other words, the gist. Retelling the story may provide some insight into the 'sense' made by the reader, particularly if evaluated in relation to the story genre. Thus, it might be assumed that the reader has understood the story if they can demonstrate in the retelling some appreciation of the story schema (as described by Stein and Glenn 1979).

Definitions of what one believes to be an indicator of comprehension have important implications for how one measures change in performance as a result of instruction. The 'meaning' vs 'sense' argument is compelling within a metacomprehension context, and perhaps explains why a comprehension test comprising of a list of questions, fails to detect subtle metacomprehension changes. Such an argument would correspond with that of Paris and his colleagues (e.g., Paris, Cross and Lipson 1984). It would be hoped that over time, and with more specific instruction at the procedural and conditional levels of training, children's ability to answer inferential questions set by others would improve, thereby demonstrating understanding at both 'sense' and 'meaning' levels. Children's ability to progress from 'sense' to 'meaning' is pedagogically important, having implications for what is taught, and when. Some suggestions have already been made as to the possible metacomprehension strategies which children would require in order to develop beyond the 'sense' stage, but the topic will be returned to later in an attempt to elaborate on a possible model of development.

#### *7.2.2.5 Delayed or immediate post tests*

It was suggested in the introduction to this section (see point VII), that one of the possible reasons for not obtaining significant changes in children's comprehension may have been because the post- test was administered immediately after intervention. It might be argued that an immediate post-test would not have allowed the children sufficient time to consolidate their new learning to apply it in a comprehension test, and thereby improve their comprehension performance. The possible benefits of a delayed post-test

are demonstrated in a study by Tolmie, Howe, Mackenzie and Greer (1993). Although their study was not related to reading it might be considered within the same genre of research, involving children in collaborative group work related to problem solving in science. They found that most progress occurred between 4 to 11 weeks ***after*** intervention. Had the post-test been administered one week after intervention as in the present study, change in performance may not have been detected. Between four to eleven weeks it might be assumed that the children continued to benefit from the collaborative group experience. The implication here is, that progress does not stop immediately after input but continues through a process of mental rehearsal, possibly to a higher level of development. Given that the mean scores on the comprehension test in the present study were moving in an upward direction, it may be that had the post-test been delayed, then greater progress may have been detected. However, given the arguments related to the development of sense and meaning, and the need for more procedural training within the instructional programme, then:

I. the process involved in moving from being able to answer ones own questions to answering others' is likely to be a rather lengthy one, taking years rather than weeks. In such circumstances a delayed post- test of 4 to 11 weeks would be unlikely to detect any significant change.
II. If the children did not have a sufficient range of cognitive skills necessary for answering inferential questions, then any amount of delayed testing would have made little difference to the outcome.

#### *7.2.2.6 Conclusions*

The results from the comprehension measure would tend to suggest that the children in the present study required more procedural knowledge in order to make significant changes to their ability to answer inferential questions. It was postulated that being able to answer others' questions as opposed to satisfying oneself about the meaning of a passage, comprise two different levels of comprehension development, the latter relating to the 'sense' of the passage and the former the 'meaning'. If, as is speculated, the children had acquired the ability to gain the sense of the passage, it would seem sensible in future research to develop appropriate assessment tools to measure such development. It was intimated that this might be

achieved by making an assessment of children's ability to retell the story to determine whether or not they were able to obtain the main ideas. Creative measures of comprehension are therefore required if metacomprehension development is to be detected. Further discussion of the assessment and measurement of metacomprehension occurs in Chapter 8.

### 7.2.3 Question Generating

The use of question generation as a measure of metacomprehension development was unique to the present study, and proved to be a useful indicator of children's self-interrogatory strategies. Given the discussion of children's comprehension scores in the previous section, question generating might also be viewed as an intermediate stage leading towards an ability to answer similar questions set by others. However, as noted in the discussion of the comprehension measure, it would seem that there are subtle differences in being able to generate and answer one's own questions, as compared with those of others. Asking oneself questions serves as a self-monitoring device, and also enables the reader to gain an understanding of the main ideas and story plot at both literal and inferential levels. The ability to ask oneself a question whilst reading, is therefore, an important metacomprehension strategy. It was hypothesised that children in the experimental condition should be more able to generate questions about a text post-intervention, and that the quality of their questions should improve as they begin to analyse the passage more deeply. Such analysis would be indicated by an increase in the amount of textually and scriptally implicit questions generated post-intervention. In relation to the number of questions generated the mean gain scores for the experimental children, above and below average readers were greater than for their matched controls. Thus, as shown in Table 3a in Chapter 6, the experimental above average readers produced average gains of 5.2 questions after intervention as compared with the control above average readers who made mean gains of 0.3 questions. Similarly, the experimental below average readers achieved mean gains of 4.1 questions post- intervention as compared with the control below average readers who produced mean gains of 0.2. The mean gain scores described above were found to be statistically significant ($p < 0.01$), indicating that the experimental children made significantly greater gains in question generation than the control children, post-

intervention.

The analysis becomes more interesting when one looks at the different types of questions generated. As previously indicated it was expected that if the intervention programme was effective this should be reflected in the number of textually and scriptally implicit questions generated by the experimental children as compared with the control children. The results indicate this to be true for textually implicit but not scriptally implicit questions. Thus, when the matched between group pairs are compared (e.g., E*A*TI vs C*A*TI; or E*B*TI vs C*B*TI) the experimental children demonstrate significantly greater gains in the generation of textually explicit and implicit questions post-intervention. It might be concluded from the data that the quantity and quality of questions generated as a result of intervention were as predicted, the experimental children being able to ask more and better questions than the control children post- intervention.

There were no significant differences in children's ability to generate scriptally implicit questions as a result of intervention. This may have been due to a lack of general knowledge related to the texts, or more likely because such questions are more cognitively demanding (Pearson and Johnson 1978). The implications of this finding are discussed later when considered in relation to the stages of metacomprehension development. What is not clear from the data, because it needs to be inferred, is whether children would have spontaneously used the strategy of asking themselves questions whilst reading independently, and whether they appreciated **why** they were generating questions. Knowing how, when, and why to generate questions whilst reading independently reflects the procedural (how) and conditional (when and why) aspects of learning. If the children were simply responding to the task demands (i.e., to generate questions whilst reading), then the activity of self-generating questions results in little more than the production of a mechanical skill, and might not justifiably be categorised as evidence of metacomprehension behaviour. To be classified as metacomprehension behaviour the reader would have to demonstrate that they understood why they were being asked to generate questions, and choose to do so whilst reading independently, as an aid to monitoring their cognitive goal, in this case, comprehension. Interpretation of the anecdotal evidence provided by the children's self-reporting, and their comments

whilst involved in the task of generating questions, would suggest that they were aware of the function of the activity and had begun to integrate this into their independent reading behaviour.

Additional evidence in support of the above hypothesis might be drawn from the final exercise (Exercise 12) in the intervention programme. The exercise involved the children in writing a letter to a friend of the class teachers, providing advice as to how to help a pupil in her class perform better in his SPMG mathematics. No tutoring was given to the children, the idea being that they should use their prior learning, thereby demonstrating whether they had learned anything from the programme and if they could generalise their acquired skills across the curriculum. The letter produced by one of the good readers in response to the exercise (see Appendix 6) demonstrates that she had appreciated the use of question generating as a means of testing her understanding. In contrast those letters produced by the poor readers tended to concentrate more on the earlier self-monitoring strategies such as stopping and starting, reading on and back and summarising, suggesting that they may not have progressed onto the higher level strategy of generating questions. One must interpret such findings with caution, however, as the 'poor readers' having poor mechanical reading and language skills, may have found it difficult to formulate, and physically write a response to the teacher's friend. Their productions may have reflected poor compositional skills, rather than a lack of metacomprehension development.

Furthermore, although there were indications from the above exercise of a qualitative difference between the good and poor readers, there were no statistically significant differences found between good and poor readers in the number, or quality of questions asked (see Tables 3b and 3e ). Like Paris and Oka (1986), the results from the data on self-generating questions would lead one to conclude that intervention had the same effect for all children.

The pattern of question generation by individual children was interesting, perhaps reflecting an increasingly complex analysis of text, starting at the literal, and moving onto the inferential. The response sheets from both the

experimental and control groups tended to begin with a specific question category, until this was exhausted, at which point the children would move onto another question category, and so forth. For example, they might start with a *what* question, and would ask 2 consecutive *what* questions before moving onto a *where* and then a *why* question. It was rare to find a script which used a mixture of question types, for example, a *'where'* then a *'how'*, back to a *'where'*, and then a *'why'*. The difference between the control and experimental scripts was the number of questions generated, and the range of interrogatives used. Thus the control and experimental scripts reflected the same bunching of interrogatives at the beginning, with the experimental groups responses becoming more diverse particularly towards the end, demonstrating a wider range of question types.

There could be many reasons for such patterning of question generation. At one level it reflects a serial form of thinking, the children moving down through the passage, looking for questions beginning with the same interrogative. Such behaviour could reflect their instructional experience since they were encouraged to "think of a 'what' question, now think of a 'why' question", and so on. However, they were also given verbal models by the teacher about why a certain question was being formulated, and what type of information might be obtained by asking the question (i.e., inferential information from a 'thinking' question). It was not a simple case of children being instructed to generate as many as possible *what, when, where ,why,* and *how* questions. The teacher would also have mixed the interrogatives, since each question being formulated would be related to the particular point in the story where the teacher had stopped, as a result of monitoring a failure in understanding. It might be argued, that the children's instructional experience is unlikely to account for the systematic and serial form of self-questioning demonstrated in their QG response sheets.

Additionally, it was noted that the control children who would not have been influenced by the instructional programme, behaved in a similar way, bunching interrogatives together.

When the range of interrogatives is investigated, together with the level of analysis of text which they would instigate, a clearer picture begins to emerge. Most of the questions generated by the children at the beginning

were *'what'* questions, which usually stimulate literal responses, followed by a mixture of *'when'*, *'where'*, *'why'*, *'who'*, and *'how'* questions (but not necessarily all of the above interrogatives). It might be hypothesised that the children initially tackled the passage at a literal level, working their way down through the passage, one literal question leading onto the next. Once they had exhausted this level of analysis they progressed to an inferential level. To formulate an inferential question the children would have to re-read sentences and paragraphs, synthesise key ideas, and then generate a question. Such behaviour is less serial in nature, the synthesis of ideas possibly taking place over non-adjacent sentences and/or paragraphs. In such circumstances the reader would be more likely to look at chunks of text, than individual sentences, which might induce a greater array of interrogatives to be used. Thus, when initially role-playing the teacher, and asking questions, the children worked their way through the passage, bunching question types together. When they moved onto a higher level of interpretation, demanding more reflexive, or metacomprehension reading behaviour such as reading back, reading on, combining sentences and paragraphs into main ideas, their questioning became more varied, reflected by less bunching of interrogatives. This latter behaviour was only obtained from the children in the experimental groups, who produced response sheets with more varied interrogatives at the end of the activity (see random samples in Appendix 5). Such a patterning of question asking may provide an indicator of metacomprehension behaviour 'in action', since the parallel form of processing required and described above may be more likened to metacognitive than cognitive behaviour, demonstrating strategic rather than skilled performance. It also adds weight to the 'sense' versus 'meaning' debate outlined in section 7.2.2.4. If the patterning of self-generated questions reflects an increasing analysis of text as argued above, then it might be supposed that the experimental children had gained a level of personal understanding (i.e., a 'sense' of the passage) at both literal and inferential levels, unlike the control children whose question generation was limited to fewer questions and reflected a literal level of self-interrogation. Unfortunately, the results from the comprehension measure would suggest that such levels of *personal* understanding were not transferred to the *public* domain of being able to answer others' questions (i.e., obtaining the 'meaning'), at both literal and inferential levels. To

progress to a 'meaning' level of understanding at both literal and inferential levels would require further development. However, it could be argued that the experimental children were closer than the control children to such a *public* understanding, since they had already obtained a 'sense' of the passage at **both** literal and inferential levels, whilst the control group children had still to demonstrate an inferential 'sense' of the passage. The assumption being made is that before being able to obtain the 'meaning' of a passage at both literal and inferential levels one would first need to have a 'sense' of the passage at these levels.

The process and progression involved in moving from sense to meaning at both literal and inferential levels is perhaps at the heart of any model of comprehension and metacomprehension development. How does this happen? What are the stages of metacomprehension development which produce different comprehension outcomes, and is it possible from the results of the present study to begin to tease out some of the points along such a developmental sequence? In discussing separately the results from each of the three dependent variables, some speculations and assumptions were made about the progression of cognitive skills and metacomprehension strategies. The following will attempt to draw this together into a theoretical model which might be used to further future research.

## 7.3 A model of metacomprehension development[1]

From the discussion so far it might be inferred that just as there is a cognitive continuum in the development of mechanical reading skills starting from the acquisition of a spoken and printed vocabulary, moving onto the development of a sight vocabulary, and then knowledge of letter/ sound combinations, there may also be a developmental progression in the area of metacomprehension. A continuum of metacomprehension development may start at the very basic self-monitoring strategies which simply make the reader aware of their internal regulatory behaviour (i.e., I do or do not understand this), ending at more complex forms of self-regulation involving knowledge about question types, ability to ask oneself such questions, and an understanding of the relationships between questions and answers. In parallel with such metacomprehension

[1] the reader may wish to refer to diagram 1 on page 253 prior to reading this section

development, it might be argued there runs a continuum of comprehension development. What is being suggested is that different levels of metacomprehension might be expected to produce different comprehension outcomes, reflecting more or less advanced comprehension skills. It was argued that the data from the cloze test measure provides evidence of basic self-monitoring behaviour as taught in Exercises 1 to 4 of the present studies' intervention programme. Such basic metacomprehension strategies may be regarded as analogous to the kind of pre-reading skills which precede the development of more formal reading acquisition. The level of strategic behaviour being measured by the cloze test might therefore be referred to as pre- or early-metacomprehension strategies, and would be placed at the beginning of a continuum of metacomprehension development. Thus, at Stage 1 of the continuum readers are aware of the need to monitor their decoding to determine if they understand what they are reading. They are also able to detect miscues because of such self-monitoring. If they detect a loss of meaning then they would be able to instigate appropriate remedial strategies such as reading on and back in the text. At a slightly more advanced level but still within Stage 1 of the continuum, the reader may also be able to use self-monitoring to obtain the 'main idea' or 'gist' of a text at a literal level. The main idea or gist at a literal level would be a comprehension outcome obtained from the application of the type of metacomprehension strategies taught during Exercises 1 to 4 which were designed to make children aware of their monitoring whilst involved in the cognitive function of decoding.

The first stage of metacomprehension development is therefore very basic, making the reader aware of his/her own thinking processes and indicating the importance of such self-awareness. It is the first step in learning the importance of reading for meaning, and that there is something which can be done in order to ensure that one keeps track of what is being decoded. Such early metacomprehension strategies are basic, but difficult for children to learn, as exemplified by the common problem of 'barking at print', i.e., decoding without making sense.

A second stage of metacomprehension development is indicated by the

results obtained by the question generating measure. As previously discussed, the children were able to generate textually explicit and implicit questions about a text demonstrating self-interrogatory behaviour whilst reading. To do this it might be inferred that they knew the difference between different question types, that they were able to formulate such questions, and it is assumed as a result could gain a personal understanding of the text at an increasingly complex inferential level. At Stage 2 the reader is beginning to identify possible gaps in his/her understanding and to generate internal questions about the gaps. However, the implicit knowledge of the text which readers have achieved through producing their own questions about the text, does not appear to help them to answer similar questions posed by others. At Stage 2 the reader is able to gain the 'sense' of the passage through generating questions, that is to obtain a personal understanding. To move to Stage 3 where the readers are able to generate questions to enable them to answer others' questions would seem to require further metacognitive and cognitive development.

To arrive at Stage 3 it might be hypothesised that readers first have to gain a general idea of what the passage is about using the strategies outlined in Stages 1 and 2: they would then need to look at the question being asked of them, identify what type of question this was (i.e., textually explicit or textually and scriptally implicit), use the type of question as a means of determining the level of interpretation which will be required on re-reading the text, think if any of their present understanding of the passage relates to the question being asked of them, and finally seek out the relevant information to answer the question. It may be that some of the 'sense' of the passage which they have already obtained from Stages 1 and 2 helps to direct readers to a particular part in the passage relevant to answering the question being posed. In this case 'sense' would be aiding and facilitating 'meaning'. A more sophisticated reader at Stage 3 would be able to predict what questions may be asked by an external source, thereby enabling them to generate more relevant questions for self-interrogation whilst reading independently. To do this they would have to have prior knowledge about the content of the text, have world knowledge about what might be regarded as important by others in relation to the content, and have experience of

being asked questions in similar learning situations. In effect readers are being asked to project themselves into the role of the third person, and to use this new perspective to generate self-questions of relevance. Given the complexity of the learning described above, Stage 3 may in fact have other stages in between. In the present study the children were unable to generate significantly more scriptally implicit questions, suggesting that their implicit question generation was still at a rudimentary level. One would therefore suspect that they were still working within Stage 2 and that their 'sense' of the passage was still restricted to simple inferences, and a good literal interpretation. To move towards Stage 3 the children would first need to be able to generate more sophisticated implicit questions to obtain a 'sense' of the passage at all three levels of understanding (i.e., textually explicit, and textually and scriptally implicit).

At Stage 3 readers would be beginning to make relationships between questions and answers and as a result of such insight, to choose the most appropriate reading skills to assist in answering the question. More significantly in relation to metacomprehension behaviour, they would have a perception of what should be known about a passage they were reading, what they themselves did not know, and therefore, what they needed to know and ask themselves about whilst reading. As quoted in the introduction *"to ask a question one must know enough to know what is not known"* (Miyake and Norman 1979). It is assumed that by Stage 3 the reader would have a sophisticated range of cognitive and metacomprehension skills and strategies to assist them in the above conundrum!

## 7.4 Conclusions

The results from the present study can only provide a sketch of the *possible* comprehension outcomes obtainable from different metacomprehension strategies. The three stages described, and shown in diagram 1, have been postulated from the results obtained in the present study and as such are limited by the data collected and the confidence with which one can generalise results from the current sample to the general population (see page 223). It would be too fortuitous that each of the three dependent variables (cloze, question generating and comprehension measures)

happened to tap *the* three stages of metacomprehension development. What is intended by the description and model shown in diagram 1, is to attempt to produce a framework from which to further elucidate, by future research, the progression of metacomprehension development in relation to reading comprehension. It is likely that there are more steps and stages on the continuum which require to be determined. In addition, the comprehension outcomes resulting from the application of specific metacomprehension strategies are speculative and would require further empirical investigation. It was not the aim of the present research to identify the nature of comprehension gains produced from different metacomprehension behaviour. Such issues have arisen as a result of conducting the research and in attempting to create a possible theoretical model of metacomprehension development from the results. However, it is an interesting area for research and has important pedagogical implications. Using the present model as a guide, it might be concluded that the children in the present study had reached a rudimentary level of Stage 2. They were able to generate questions for self-interrogatory purposes at textually explicit and implicit levels to help obtain a 'sense' of the passage they were reading. They would have required more procedural and conditional knowledge in how to answer others' questions than that provided in the present study, in order to move onto Stage 3. There were some indications from the comprehension measure that the children were perhaps beginning to use their metacomprehension knowledge obtained at Stages 1 and 2 to assist in answering others' questions, but given that the results were not significantly different from the control children, one might conclude that they still required more time and input at the levels already described to demonstrate any significant changes.

Chapter 7 has attempted to address some of the theoretical issues arising from the data obtained in the present study. In doing this other factors have been highlighted which are worthy of further comment. Thus, some of the methodological concerns such as those presented by the assessment and measurement of metacomprehension were discussed in the introduction but return to haunt the metacognitive researcher, and require further comment. Related to measurement of change in metacomprehension is the

theoretical issue of matching individual metacomprehension needs to appropriate intervention. Diagnostic assessment may be required to select subjects according to need, and to match such needs to appropriate metacomprehension intervention strategies.

Finally, there are methodological issues related to the length of intervention, the relative value of specific activities such as self-monitoring, and the effects of different methods of presenting metacomprehension strategies.

The prescriptive nature of the programme together with the fact that the results were collapsed across three different schools and teachers, statistically controls for some of the potentially confounding variables outlined above. Thus, because of the design of the teaching programme all of the teachers had to deliver the metacomprehension activities in the same order and within the same time scale. Individual discretion in the delivery of the programme was therefore not possible. Additionally, given that three different teachers and schools were used it might be assumed that the results were due to the effects of the programme, rather than individual teacher or school effects. However, despite the above controls some variability between teachers may have occurred during the delivery of the programme which might have been addressed by the collation of process data.

The lack of process data makes it difficult to know if:

- teachers' had different presentation styles and if so, did this make a difference to the children's acquisition of metacomprehension strategies (section 8.3)
- particular material within the metacomprehension programme was more or less effective than others (section 8.5)
- all children responded similarly to each of the exercises (section 8.2)
- all of the exercises were completed with the same thoroughness (section 8.5)
- the exercises were all completed
- the programme itself had any effect or if teachers were simply better teachers as a result of training (section 8.4)

Comments made to the researcher by the teachers half way through and at

the end of the programme (see section 6.2.5.4) allow some speculative evaluation to be made about some of the above methodological concerns. For example, all of the teachers felt that they had rushed the exercises at the end and stated that they would have liked more differentiated material to develop self-monitoring skills. They all reported having finished the programme. However, more robust evidence of the teaching and learning process would have been valuable, particularly in informing the model of metacomprehension development discussed in section 7.3. Such information might have been obtained by:

- video/audio taping the teaching sessions, thereby allowing an analysis to take place of both the teachers' delivery of the metacomprehension programme and the children's responses to the different exercises. It would also have allowed the researcher to look at the progression of strategy development as the programme progressed.
- issuing questionnaires to children and teachers to assess more formally their responses to the metacomprehension programme. These could be administered at different points during the programme, thereby allowing the researcher to look at the changes in strategy development taking place over the duration of the programme.
- observing the interactions taking place within the classroom during the delivery of the programme (see section 8.3 for related discussion).
- photographing the children and teachers at work together with the products of their activity (time lapse photography).

Incorporating some process information into future research designs of metacomprehension development may help to support the data obtained from the present study. Chapter 8 will go on to discuss the above in more detail, building on the results obtained from the present study and attempting to provide some guidance as to the important issues for the design and development of future research.

## STAGE 1

Early Metacomprehension strategy development

e.g. Basic self monitoring such as stopping and starting whilst reading to assist in answering basic internal question of "do I understand"

e.g. Summarising, reading back and on in the text, stopping to 'take stock'

Gains literal level of understanding, can extract the gist of text, thereby making 'sense' at a literal level of understanding

## STAGE 2

Intermediate Metacomprehension strategies

## Metacomprehension Strategies

e.g. Asking internal questions whilst reading, as a means of self-assessment to determine understanding"

Cognitive | Skills

Looking at title, identifying literal and inferential questions, asking self literal and inferential questions

## Comprehension Outcomes

Gaining 'sense' at a literal and basic inferential level

## STAGE 3

Advanced Metacomprehension strategies

e.g. Knowing what you do not know in order to know what it is you need to know. Acting as the third person when self-generating questions so as to be predictive. Linking question type to form of reading required.

e.g. Ability to formulate all three question types, extensive word and subject knowledge

Gaining 'meaning' at literal and advanced inferential levels : ability to answer others' literal and inferential questions

# Chapter 8: Key Issues Arising and implications for future research

## 8.1 Introduction

As outlined in Chapter 7 the following concerns itself with some methodological and theoretical concerns which have arisen from the present research, and which appear to the author to require further consideration if the study of metacomprehension is to be progressed. Specifically, the Chapter will look at:

- the matching of individual metacomprehension needs to appropriate forms of intervention
- the effects of programme content vs method of presentation
- the possible confounding effects resulting from increased teacher knowledge
- programme content
- the measurement of metacomprehension.

## 8.2 Matching needs to intervention: a problem of differentiation

It was noted in Chapter 2 that the definition of what constitutes a good and poor reader frequently differs between studies. A 'good' reader may be defined in terms of their mechanical reading skills, their comprehension skills or a combination of both. 'Good' and 'poor' readers may differ greatly, depending on the definitions used by researchers. The definition and subsequent identification of reading difficulty becomes important when one begins to differentiate between subjects in order to match their needs with appropriate intervention strategies. It was intimated in the discussion of the results in Chapter 7, that some metacomprehension reading instruction can be detrimental to some readers, since it inhibits existing strategies, or interferes with effective automatic processes, making conscious those thinking processes which are normally unconscious. It was suggested that this is particularly the case for 'good'/'skilled' readers (Palincsar and Brown, 1984).

Given the possible detrimental effects of intervention it would be relevant to ask the question: *which specific aspects of metacomprehension intervention are likely to produce positive effects, and for which type of reader?* Such a question highlights the need to identify readers' strengths and weaknesses, and to match such information with more finely tuned intervention strategies. 'Mr. Homunculus the Reading Detective' was a blanket approach to teaching children metacomprehension strategies. To obtain greater effectiveness it would probably need to be more clearly differentiated and matched to individual needs. To identify needs, better assessment tools are required. The author would argue that further research is required in the area of assessment, both in terms of identifying children's metacomprehension reading strengths and weaknesses, and in defining the forms of intervention which are most effective with different categories of readers. For example: stopping and starting whilst reading to ask the question "Do I understand?", may be a useful monitoring strategy for children who are not already doing this independently. It may not be helpful, and could interfere with meaning by interrupting the flow, to those who are already monitoring independently. It would therefore, be necessary to assess which children required such basic self-monitoring strategies. However, it may be that all children would benefit from such instruction, since depending on the complexity, or genre of the material being read, all readers will at some point need to make conscious the unconscious monitoring which occurs during the reading of relatively easy texts. The argument would be that when the activity of reading is progressing fluently, teaching children to stop and start (to encourage self-monitoring) is at best superfluous, and at worst, a negative activity. However, if children are never explicitly taught about such a skill, given practice in using it, and told when and why it might be useful, then what do they do when they come across problems with a difficult passage? It is unlikely that during fluent reading they will be aware of their own self-monitoring behaviour, since in such contexts the behaviour is automatic and unconscious. Only when this is brought to their attention by an adult, or when they are confronted with a difficult text and find that they have no remedial strategies, are children likely to become consciously aware of the need to self-monitor.

Given the significant results obtained in the present study for all the experimental group children in relation to cloze procedure, the author would argue that teaching all children the very basic monitoring strategy of starting and stopping is important, but that it may have been more beneficial to introduce such strategies when they were appropriate for each individual child, rather than as a standardised reading lesson. Such matching of need with intervention is particularly important when one considers the motivational aspects of learning. As indicated previously, children need to see the purpose of applying a strategy, and believe in its efficacy, before they are likely to use it during their own independent reading (Paris, 1986; Kurtz-Costes, Ehrlich, McCall, and Loridant, 1995). The use of different reading material which forced errors, thereby highlighting for the reader the necessity for the application of self-monitoring strategies, could have been used for this purpose.

To achieve such individualisation would require better identification tools to assess more precisely the appropriateness of different metacomprehension strategies for children at different stages of learning. From the feedback and results obtained in the present study, it was apparent that the self-monitoring exercises were useful for both good and poor readers. It was a surprise to all of the teachers that children whom they considered as bright, articulate, and 'expert' readers, still had problems identifying miscues in texts. This was the case even when the teacher deliberately slowed down when approaching an error, thereby modifying the tone of voice, and generally prompting the children into listening and looking more carefully at the text. Such anecdotal evidence is corroborated by empirical data which highlights the difficulties which both able and poor readers have in spotting deliberate errors in text (Markman, 1977; 1979; Oakhill, 1995). Teaching children to monitor meaning through the use of miscued passages would therefore seem to be appropriate for all children. However, should good readers start with this skill, or do they need to experience the idea of stopping and starting first in order to appreciate the use of error detection? Such questions have not been directly answered by the present research, reinforcing the need to develop a clearer picture as to which exercises are appropriate for which groups of children, and in what circumstances.

Implicit within Paris' (1991) notes for teachers, are instructions which might be interpreted as attempts to differentiate metacomprehension activities appropriate for different types of reading failure. He notes for instance that *"literal readers need to learn that meaning is in their minds, and not on the page.....These children might benefit especially from using reading for other purposes, such as writing or giving reports...."*. In the same paper he suggests that children who are poor at decoding need to *"examine the text before reading...they need to learn to pause.. to paraphrase..."*. From these examples it is possible to see that Paris is attempting to define the nature of children's reading problems and the form of intervention which may be most appropriate. Unfortunately, there are no specific empirical data to validate his suggestions. It may be questioned as to whether such a thing as a 'literal reader' exists, since this may be influenced by text difficulty and genre, producing a 'literal reader' in one context but not in another. It is also not known if the intervention strategy suggested by Paris to support *literal readers'* difficulties is better than, for instance, teaching inferential question generating as a self-interrogation strategy.

The lack of empirical data to determine the differential effects of different metacomprehension strategies on different reading problems, may reflect the relative youthfulness of the area. All of the instructional programmes reviewed, together with the present research, have taken a 'scatter gun' approach; teaching a variety of metacomprehension strategies before, during, and after reading, with the hypothesis that such intervention improves comprehension. Such global approaches make it difficult to determine if some strategies in a programme are more effective than others in achieving improved metacomprehension. It was suggested in the description of the Mr. Homunculus programme that self-monitoring was important, and as such these skills were introduced at the beginning. Would the same or different effects have been achieved by omitting the other strategies and concentrating on self-regulation? Alternatively, is it the interaction of all the strategies taught in the programme, forming what might be referred to as a 'metacomprehension gestalt', which produces the positive effects? Obviously, questions related to the content and structure of metacomprehension programmes has important pedagogic implications and need to be addressed in a systematic manner. It would seem

reasonable to conclude from the present study that there are positive effects from teaching children strategies such as those contained in "Mr. Homunculus", but the nature of the effects, and the relative importance of the different strategies needs to be explored more fully.

It might be suggested that further research is needed, to look at what the important instructional variables are, and how these interact with different types of reading problems. To do this, better diagnostic assessment tools are required:

1. to select subjects according to specific needs, and
2. to detect the subtle differences in behaviour which might result from different metacomprehension interventions.

Such an investigation may lead the researcher into multivariate forms of analysis, or a series of small-scale studies where children with different types of comprehension difficulty are given the same or different metacomprehension strategies, and the effects of intervention compared across conditions.

In making the above speculative arguments, it should be acknowledged that empirical applied research has a long and complex journey to travel before achieving such differentiation particularly since there is no clearly defined theoretical model of the progression of metacomprehension development in relation to reading comprehension. The author has attempted to delineate three possible points on a continuum (diagram 1) of metacomprehension development based on the data obtained from the present thesis. Such a model remains tentative, and as noted previously requires further investigation. The future of metacomprehension research may be in determining the metacomprehension strategies necessary to progress from novice to expert. Having ascertained such development it may then be possible to begin to assess children's strengths and weaknesses and match them to appropriate intervention programmes.

## 8.3 Programme content or method of presentation?

The above discussion has focused on the interactions between programme

content and type of reading difficulty, yet it was emphasised in the introduction that the **way** in which an instructional programme is presented and the vehicle for so doing, are equally important. It might be argued that changes in performance resulting from intervention were due to the teaching methods deployed, rather than to what was being taught. The issue is one of 'How' versus 'What'.

Three teaching methods were used in the present study; direct explanation, reciprocal teaching and modelling. All three modes of presentation were used interactively, dependent on the demands of the task. At the beginning stages of a new strategy there was an emphasis on direct explanation, the teacher explaining what the strategy was, how it might be used, and why it might be useful. Direct explanation was then supported by a combination of reciprocal teaching and modelling. A central component of all three teaching methods, but more especially of reciprocal teaching and modelling, are the interactions which occur. In the present study dialogues were encouraged between teacher and pupils, pupil and teacher, and pupils and pupils. Reciprocal teaching and modelling in a metacomprehension context are particularly powerful since they allow the learner to gain direct insight into the thinking processes of another, making thinking public (Paris, 1986). For instance, in Exercise 1, the teacher was encouraged to make explicit her thinking processes whilst reading, and later, to verbalise the fix- up strategies which she was about to use to try and remediate a failure in understanding. The cooperative teaching and learning which was established through the use of reciprocal teaching and modelling may have been a significant factor in the positive outcomes achieved in the present study. Some investigators would claim that the dialogues obtained through teacher-pupil or peer group interactions, are more significant in promoting children's reading, than the content of what is taught. Pearson and Fielding (1991) note that *"how children learn to think about what they read may be as much a function of how they interact with the teacher and with one another and how much responsibility they take for initiating questions and topics of discussion as it is a function of the cognitive demands of teacher-directed interventions and teacher posed questions."*

Similarly, Top and Osguthorpe (1987) found that tutoring ***methods*** were more important in teaching children decoding reading skills than the ***content*** of the teaching programme. Thus, children who were taught by peers who had been tutored to use a variation of reciprocal teaching, out-performed those children whose tutors had not been trained to use reciprocal teaching.

It may be argued that what was most interesting about the present research were the interactions and social learning occurring between teacher, child and children. Perhaps metacomprehension strategy training encourages better reciprocity of interaction leading to improved learning. The teaching methods and content of metacomprehension activities complement one another, as compared with more traditional instructional programmes which have grown out of a behaviourist tradition. If this is the case then perhaps what one should be assessing are the social and aesthetic outcomes of metacomprehension research, rather than the more traditional cognitive gains. Within such a context the questions asked of intervention may be of the form:

- do children interact more with one another?
- are children's conversations qualitatively different?
- do teachers think and teach differently after experiencing and implementing a metacomprehension programme?

Observations made in the present study (see Sections 6.2.5.4.2 and 6.2.5.4.3) suggest that there were changes in the way children and teachers responded. Most of the teachers evaluated the programme positively saying it had *"changed the way I think about comprehension"* and, *" I will definitely be altering what I do with children now...I didn't expect them to be able to think and discuss their reading in the ways they have demonstrated"*.

The children looked forward to discussing Mr. Homunculus and particularly enjoyed the empowering experiences of being able to be the teacher. Such empowerment might be expected to have the effect of increasing their confidence, leading to greater success (e.g., Covington, 1992; Clark, 1996). These effects could be important factors in determining the success or

failure of a programme.

The issue related to methods of presentation and subsequent metacomprehension outcomes is discussed by Mateos and Alonso (1991). They compared the effects of a self-monitoring programme on a group of children aged between 9 and 11 years. The programme was presented in one of two ways:

1. using explicit instruction, reciprocal modelling, and practice
2. using reciprocal modelling and practice.

Another group of matched children were not given the programme but were exposed to the traditional approach of reading and answering comprehension questions. Their results are difficult to interpret, since performance was not the same across the various measures used to assess progress. However, it would appear that explicit instruction with reciprocal modelling and practice produced the best results, but was not necessarily superior to the condition without explicit instruction. Both conditions 1 and 2 were better than the traditional method. These results are inconclusive, but reinforce the need to investigate the interaction between teaching methods and instructional content. In addition, if as argued previously, the teaching methods of reciprocal teaching and modelling provide complementary technologies for the teaching of metacomprehension strategies, then it would be interesting to study the interactions occurring in the class-room within a social learning framework. Do certain teaching methods produce changes in behaviour on the part of the expert and novice, and are such changes more or less likely to produce strategic readers?

## 8.4 Teacher training or programme content?

It has been assumed so far that the gains in metacomprehension, as measured by the cloze and question generating measures, were due to the impact of the metacomprehension programme. However, it might be argued that the programme was of limited impact, and what was most significant was the increased knowledge and skills of the teachers in the experimental condition as compared with the control teachers, as a result of the in-service training programme. Thus, after in-service training the

teachers were simply better at teaching metacomprehension and would have achieved similar results with mainstream materials and no metacomprehension programme. It would be possible to test such an hypothesis by introducing another experimental control group whose teachers were provided with the same in-service training as in the present experimental group, but not the metacomprehension programme, but instead used the novel, as in the control group.

Evidence from previous research cited in Chapter 5 (e.g., Nisbet and Shucksmith, 1986) suggests that teachers require the structure of a programme such as 'Mr. Homunculus the Reading Detective' in order to provide the motivation to implement their new learning, and to provide them with the confidence to adapt and modify the theory into existing practice. The programme gives the teachers a learning and teaching model, adding to the impact of the initial in-service training, thereby acting as continuing professional development material as well as a teaching programme for children.

It is interesting that Paris and Oka (1986) made a similar point to the above in relation to their metacomprehension programme: 'Informed Strategies for Learning (ISL)' stating, *"the materials provided them* (the teachers) *with a wealth of new information about cognitive strategies*". The inference being, that teachers were previously uninformed about cognitive strategies and that ISL had acted as a form of professional development. However, if one believes that success in comprehension instruction depends on teacher *knowledge*, *materials* and *methods* (Paris, 1986), then it might be assumed that all three components are important. The question for future research might be to determine if each factor, teacher knowledge, materials and methods, are equally important, or if one is more significant than another.

## 8.5 Modifications to the programme.

The discussion has already covered a number of important points in relation to the programme. This section will therefore be brief, looking at changes in the content of specific exercises.

It was noted that the early exercises designed to develop self- monitoring

were probably of use to all children, and as a result more time could have been devoted to their development. Given that the feedback from the teachers concurred with that in previous research related to the difficulty children have in detecting errors, and therefore in implementing appropriate monitoring strategies, it would have been useful to differentiate the tasks, breaking them down into more discrete activities. Instead of mixing the type of errors which children had to spot in Exercise 2, more examples could have been given using only one type of error. For example, separate exercises could have been used for typographical, syntactical and semantic errors. In this way the children would have been more focused on the type of miscues they were looking for, which may in turn have made them more alert and confident in spotting them.

It was indicated that a term, rather than four teaching sessions could have been spent on developing the self-monitoring skills introduced in the first four exercises. It was also suggested that the idea of Mr. Homunculus as the voice in the head was overshadowed by Mr. Homunculus the detective, as the programme progressed. More practice in the self-monitoring strategies presented in Exercises 1 to 4 may have prevented this from happening. It may also have been useful to intersperse self-monitoring exercises throughout the programme, thereby reminding the children of the need to self-monitor. One teacher suggested having headed paper for use in all of the children's writing activities, with Mr. Homunculus prominently displayed, thereby acting as an "aide memoire". In retrospect it was very ambitious to expect both the teachers and children to master the self-monitoring and self-correcting strategies introduced in the first four exercises. This is particularly so, given that it was known that children have problems in regulating their reading and spotting errors in understanding, and that teachers rarely instruct children in how to understand, let alone how to think about their thinking. Given the importance of self-monitoring for reading with understanding (e.g., Markman 1977; 1979; Garner and Kraus, 1982; Brown 1987; Wray, 1994; Mateos and Alonso, 1994), it would be justifiable to create a whole programme around the development of these skills, introducing the question generating and answering skills in separate modules. However despite this criticism, it should be remembered that the results for the cloze test were significant, indicating that children

had learned to self-monitor despite their early difficulties in spotting miscues.

It was noted in the discussion of the results for the comprehension measure, that more procedural and conditional knowledge were required to enable the children to better answer inferential questions. In future the exercises could be differentiated, each teaching specific skills such as looking for the main idea, or key words (similar to Graves, 1986 and Yuill and Oakhill, 1988). More research would be required to achieve meaningful differentiation which would be dependent on better assessment of the needs of individual groups of children with similar reading problems, together with better tools for diagnosis. Irrespective of these difficulties, more time should have been spent on Exercises 6 to 10. It was certainly commented by two of the three teachers, that they found themselves rushing at the end to finish the exercises (see 6.2.5.4.2 -A). Had they not been restricted by the research timetable, the teachers would have spent longer on teaching the relationships between question and answers, and talking through the strategies used to find information in the text to answer inferential questions. In the last exercises the conditional aspects of learning (i.e., the strategic components), were sacrificed as a result of trying to complete the tasks in time for the researcher. More time was required to ensure mastery of the metacomprehension strategies of generating questions, using this to self-assess, and transferring such strategies to assist in the answering of others' questions.

In addition to the above, more explicit teaching of the procedures involved in finding answers to inferential questions would be helpful in future re-drafts of the programme. In the present study, it might be argued that too little time was spent on developing inferential skills- the cognitive aspects being sacrificed for the metacognitive. Such a criticism may be justified by the knowledge that teachers generally do not teach comprehension. Thus in introducing a metacomprehension programme, one is perhaps starting at a level above that which the teachers or the curriculum is at. It is perhaps not surprising that the largest gains were found in the more direct metacomprehension measures of cloze procedure and question generating. For inferential comprehension abilities to benefit from such

gains, it would have been necessary to spend more time on teaching specific comprehension skills.

Finally, a question arises as to whether or not some of the strategies introduced in the programme could have been done at a younger, or older age. From the response of the children involved in the present study, it may have been possible to introduce the idea of monitoring reading at an earlier stage of development. This would be advantageous to the more fluent readers, but not so for the less able. Many of the teachers felt that they would have liked to introduce the first four exercises at the primary 3 stage (aged 7yrs 6mths). Questions may arise, as to whether children as young as this would be able to appreciate the concept of self-monitoring. However, it is possible that by making the idea concrete in the form of Mr. Homunculus, younger, more able children would be able to grasp the idea of an "inner voice" and is therefore, worthy of further exploration.

The opposite is true of the latter exercises. It might be argued that the children were too young to begin to make the associations between question type and answers, at least in respect of being able to use such information to answer questions. It may have been more appropriate to have introduced these exercises at a later stage. Alternatively, if the earlier monitoring strategies had been introduced at a younger age, the children may have been more prepared for the latter exercises which introduced Given (textually explicit), Thinking (textually implicit), and Me (scriptally implicit) questions. It was not the problem of identifying the questions, but using the information conditionally, which presented difficulties. It may therefore be appropriate to introduce declarative knowledge about the different question types at primary 5 stage, moving towards the procedural and conditional aspects of using such knowledge to answer similar forms of questions. It might be argued that the whole issue of when to introduce different exercises depends on building a progression of metacomprehension activities into the language curriculum, which once again returns to the idea of differentiation, assessment of need, and matching intervention accordingly.

## 8.6 Assessment of Metacomprehension abilities

It has been indicated in the foregoing that the assessment of metacomprehension strategies is an important area for future research. The measures used in the present study infer metacomprehension behaviour from performance resulting at the end of intervention. Each dependent variable was concerned with the end product, rather than the ongoing process involved during the intervention period. Given that metacomprehension is a dynamic thinking process, responsive to behavioural feedback obtained during the activity of reading, it may be more meaningful to try and measure the process as it was happening, rather than as an end product. However, early attempts at measuring process such as the use of think aloud protocols have already been discussed and found to be wanting. The question for future research in the methodological area may be: are there any more effective ways of measuring metacomprehension development? Observing the readers' behaviour in the process of performing a function such as answering comprehension questions, may provide some insight into their metacomprehension. For example, in the present study the eye movements of the children in the experimental groups appeared to be different post-intervention. When the children in the experimental groups were asked to answer comprehension questions after the intervention programme, they seemed to demonstrate more activity, searching in the passage for answers, looking backwards and forwards in the text, and generally interacting and engaging more with the print. Such behaviour was indicated by finger pointing, scanning, and not asking the examiner if they could use the passage to answer the question. Before the intervention phase, the children either tried to answer questions from memory, or asked permission to look at the passage, signifying their belief that comprehension was a memory task, rather than a constructive, meaning gaining activity. Such behaviour was not atypical, as evidenced by Hansen and Pearson's (1983) comment on the fact that children are taught to read to remember, rather than to think and infer. If one accepts the validity of the above observations, then one may be able to infer that the early self-monitoring skills and subsequent remedial strategies of re-reading, reading on, and summarising had some influence on the children's behaviour, as indicated by scanning and finger pointing. Observations of behaviours such as scanning, and finger pointing could be used as a legitimate

indicator of metacomprehension activity, but would not provide specific information as to why such behaviour had been induced, or its particular function. To determine such conditional information, readers would need to be questioned about why they were scanning for information, and what they were looking for. It might be argued, that in resorting to such questioning, the methodology is subject to the same criticisms made previously of questionnaires, structured interviews and think aloud protocols, i.e., that young children have difficulty articulating complex cognitive functions, and therefore fail to provide reliable verbal information. However, if questioning was done in response to observations of what was thought to be evidence of metacomprehension behaviour, it might be argued that such interrogation would be more meaningful to the readers, since they would be reporting on behaviour in which they were currently engaged. Such an argument would not account for children who have poor linguistic skills, and who might be expected to have difficulties with verbal responses irrespective of how meaningful the context.

Observations of specific behaviours such as scanning and finger pointing, together with expertly framed questioning, resulting from interaction with both text and child, begins to move the researcher into more dynamic forms of assessment, tapping the process rather than the product. In the area of metacomprehension such dynamic forms of assessment would seem to be more in tune with the cognitive function being investigated. However, the question remains, are there any other more effective ways of measuring metacomprehension development?

### *8.6.1 Innovative measurement strategies?*

It was noted in the introduction that metacognition might be considered as a superordinate skill which allows children to behave strategically, and in so doing to become independent learners. It is the striving for independence of thought and learning which is perhaps one of the most appealing aspects of the concept. But how do children arrive at such independent thought, and can the process of such development be measured in the context of reading for meaning? In Vygotskian terms, a child who moves from the cognitive to the metacognitive might be regarded as having internalised previously socially mediated behaviours. For example: a child may be

taught through modelling and practice to self-monitor their reading behaviour and to deploy remedial strategies in response to the detection of a reading failure. Initially the 'expert' (usually a teacher or more capable peer) guides the readers by making them aware of their reading failures and prompting them into using an appropriate strategy. At this stage the readers are dependent on expert guidance and are operating at an interpsychological plane. When they are able independently to perform such self-monitoring behaviour, and choose an effective corrective strategy from an array of possibilities, they may be regarded as having internalised the 'expert' instruction so that it has become part of their own behavioural repertoire. These readers have moved from the inter- to the intra-psychological plane. During the process of internalisation there will be varying amounts of adult guidance required. If it was possible to measure the stage in the process of internalisation as a proportion of the amount of adult guidance required, then it may be possible to assess the stage the reader was at on the continuum of moving from the cognitive to the metacognitive. Early exploratory studies by Brown and Ferrara (1985), attempted to apply such thinking as a means of demonstrating the difference between actual, and potential development. Unfortunately, the use of dynamic assessment models for measuring change in performance does not seem to have moved much further than Brown and Ferrara's early work, and might therefore, be considered as a fruitful area for further development within the metacomprehension field of study.

***For example:*** If one wanted to see how close a child was to being able to answer an inferential question independently, thereby moving from the inter- to the intra-psychological plane, it would first be necessary to perform a task analysis of the steps required to answer the question. This might take the following form:

1. is the question being asked a 'given', 'thinking' or 'me' question? If it is a 'thinking' question then .....
2. look for the key word(s) in the question (eg: in the question "Why was the dog feeling drowsy?, the key words would be "dog" and "drowsy").
3. find the key word(s), or similar in the passage.

principles apply to the teaching and learning of reading comprehension.

The novel could provide a sympathetic medium for incorporating a metacomprehension programme. It is more likely to motivate children as compared with normal reading schemes and it would involve the teacher and pupil in a dialogue aimed at achieving a shared body of knowledge. During the process involved in reaching a state of shared knowledge and understanding the teacher should have been afforded opportunities for discussing with the children the thinking skills involved in achieving meaning. In this way the novel provides opportunities for "mediated learning" (Feuerstein 1980): the novel possibly being the mediator in the process of learning to become a self-directed and strategic reader.

It is likely that the medium for teaching metacomprehension skills is not as important a deciding factor in whether children develop metacomprehension skills, as is the explicitness and content of the teaching programme. The novel study could therefore, be used as a vehicle for teaching metacomprehension strategies, but the success or failure of the programme will probably depend on the instructional content than the medium for introducing it.

## 4.9 Conclusions

It was noted in the introduction to the pilot study that the motivation for the present research was based on the premise that metacomprehension strategies are not currently taught to children, and that to enable such instruction to be incorporated into the curriculum, children and teachers would need to have this as an explicit aim. It was also suggested that the novel may provide a sympathetic medium for introducing metacomprehension strategies. The pilot study was therefore designed to establish:

i) if metacomprehension strategies were presently being taught in the mainstream classroom

ii) if the use of a novel was more likely to achieve gains in metacomprehension as compared with a mainstream reading scheme

iii) if there was a difference between good and poor readers in their metacomprehension attainment.

An additional, and alternative, assessment measurement was unintentionally provided by the final exercise in the present study. As described previously, the children were asked at the end of the programme to write a letter to the teacher's friend, providing advice about how to help a child in her class overcome difficulties in completing his SPMG mathematics. The letters provided a wealth of information about the children's metacomprehension knowledge at all three levels of understanding (i.e., declarative, procedural and conditional). They also provided an indication of the amount of transfer which had occurred across curriculum areas. If the exercise had been used pre- and post- intervention, an item or content analysis of the letters may have provided a useful measure of the children's acquired metacomprehension knowledge.

Finally, an alternative way of assessing children's knowledge about reading and their awareness of the influences of task, person, and strategies on performance (Flavell, 1985) may be to use a Rep Grid, based on Kelly's personal construct theory (Kelly, 1955). It would be possible to devise didactic constructs based on the knowledge already available from research about how children construe reading. For example, it is known that beginning readers view the task of reading as a decoding exercise (Clay, 1967; Johns and Ellis, 1976). Such perceptions might inhibit children's progress towards reading for meaning. As a result of metacomprehension intervention one would hope to see a shift in children's construing of this construct. One possible construct for a Rep Grid may therefore be:

*Reading is about working out what words say vs Reading is not about working out what words say*

Such a procedure would provide a more objective measure of children's shifting constructs in relation to reading, and would not be as prone to the criticisms noted in relation to structured interviews and questionnaires. Obviously, a detailed analysis of how Kelly's theory could be used is beyond the scope of this thesis, but it is perhaps worthy of exploration in future research.

## 8.7 Concluding remarks/Epilogue

A major issue concerning the step by step progress in the development of metacomprehension strategies has been raised by the present research. It appears that children can be taught to be better self-monitors of print, and can apply self-interrogative strategies to gain the main idea from a passage. However, what is required is a refinement of the present study to determine:

*I. the interaction between specific metacomprehension strategies and the consequent comprehension outcomes, and*

*II. which children are likely to benefit from which form of metacomprehension intervention*

Such issues are important if classroom teachers are to be guided in what to teach, to which children, and when. A better theoretical model of metacomprehension development is therefore, required which in turn should lead to more comprehensive diagnostic assessment tools helping to identify children's metacomprehension strengths and weaknesses.

An attempt was made to try and begin to answer the first of the two questions raised above and was presented as diagram 1 (p. 253), and described in Chapter 7. The model presented suggests that metacomprehension is not a unitary concept. Such a conclusion is similar to that cited in the introduction by Thorpe and Satterly (1990) in relation to the general concept of metacognition. An inference may be made that within each metacognitive domain (i.e., metamemory, metalinguistics and metacomprehension), there is differentiation and progression. The central question for future research is therefore, to determine whether or not, as has been speculated, there is a developmental progression of metacomprehension strategies, and if so, what are the stages of such development, and what would one expect in terms of comprehension outcomes?

To investigate these questions further it will be necessary to look more specifically at the effect(s) of different metacomprehension strategies on different age and ability groups of children. In this way it should be possible to begin to determine the comprehension outcomes which might be

expected from the application of different metacomprehension activities for readers of different ages and reading aptitude. Over leaf is a diagrammatic representation of how this research question might be tackled and might be regarded as an action plan for future investigations. It is based on the model described in Chapter 7. As it is presented in diagram 2, three separate investigations would be necessary at each of the proposed 'stages' of metacomprehension development using matched samples of children representing different ages and reading ability. The intervention would be targeted at developing the metacomprehension strategies postulated in diagram 1 and representing the three stages of metacomprehension development. If the model is correct, then one would expect differential effects from intervention on readers' comprehension for the different age and reading ability groups. For example, to determine the validity of the model presented in Stage 1, diagram 1, an intervention programme which targeted the teaching of self-regulation might be deployed. Thus, children would be taught to stop and ask themselves the question "Do I understand?". The aim of such metacomprehension instruction would be to ascertain whether all children benefited from such specific training, or as would be predicted, whether only poor and young readers benefited. In addition one would be interested in *how* such metacomprehension behaviour improved comprehension. For instance, does it enable children to retell the main idea of the story, or does it simply draw to children's attention the need to be constantly vigilant whilst reading so as to detect failures in understanding?

To conclude, many questions have still to be answered and in some respects Flavell's (1987) comments quoted at the beginning of the thesis are still pertinent (i.e., *"none of us* (psychologists) *has yet come up with deeply insightful, detailed proposals about what metacognition is, how it operates, and how it develops"*). The author would argue that the present thesis has begun to delineate more precisely what metacomprehension is, and provide guidance as to how it *may* operate and develop in relation to children's understanding of narrative print. Further empirical research as described above should help to provide more concrete evidence for the model proposed.

## STAGE 1
Early Metacomprehension strategy development

## STAGE 2
Intermediate Metacomprehension strategy development

## STAGE 3
Advanced Metacomprehension strategy development

### Matched randomised sample
P3 (7yrs 6 mths) → P7 (11yrs 6mths)

Good/ Poor Readers — Good/ Poor Readers

### Intervention Programme
(e.g. Exercises 1 – 4 from Mr Homunculus)
Strategies which emphasise simple self-monitoring such as stopping to ask 'Do I understand?', looking for possible areas of misunderstanding.( Viz. Markman, 1977/78; Garner & Taylor, 1982; Oakhill , 1984; Currie, 1996)

### Comprehension Outcomes
e.g. assessment of comprehension process and ability to retell story, measured by dynamic assessment of process ( Viz. Brown & Ferrara, 1985)

### Matched randomised sample
P3 (7yrs 6 mths) → P7 (11yrs 6mths)

Good/ Poor Readers — Good/ Poor Readers

### Intervention Programme
(e.g. Exercises 5 – 8 from Mr Homunculus)
Strategies that encourage children to identify question type thereby increasing metacomprehension, knowledge of task and strategy. (Viz. Baumann,1982; Hansen & Pearson, 1983, Paris & Jacobs, 1984; Malone & Mastropieri, 1992.)

### Comprehension Outcomes
e.g. measured by dynamic assessment of reading process and ability to answer literal and simple inferential questions set by others.

### Matched randomised sample
P3 (7yrs 6 mths) → P7 (11yrs 6mths)

Good/ Poor Readers — Good/ Poor Readers

### Intervention Programme
(e.g. Exercises 9 - 11 from Mr Homunculus)
Strategies which emphasise the relationship between questions and answers, the use of generating questions for self – interrogation and monitoring of ongoing reading comprehension at an inferential level. (Viz. Raphael & McKinney, 1983; Palincsar & Brown, 1984; Paris, Cross & Lipson, 1984; Raphael & Pearson, 1985; Currie, 1996)

### Comprehension Outcomes
- Improved ability to answer others' questions at inferential level
- Better awareness of strategic knowledge in relation to question generation
- Better self-appraisal of comprehension processing and insight into when to use strategic knowledge.

Measured by dynamic assessment and comprehension test.

# References


Anderson, R.C., Reynolds, R.E., Schallert, D.L. and Goetz, E.T. (1977). Frameworks for comprehending discourse. *American Educational Research Journal*, **14**, 367-381.

Anderson, T.H., Armbruster, B.B. and Kantor, R.N. (1980). How clearly written are children's textbooks? Or, of bladderworts and alfa. *Reading Education Rep. No. 16*, Urbana: University of Illinois, Centre for the Study of Reading.

Andre, M.D.A. and Anderson, B.B. (1978-1979). The development and evaluation of a self-questioning study technique. *Reading Research Quarterly*, **14**, 605-623.

Arnold, H. (1984). *Making Sense Of It.* London: Hodder and Stoughton.

Au, K. and Mason, J. (1981 -82). Social organisational factors in learning to read: The balance of rights and hypothesis. *Reading Research Quarterly*, **17**, 115-52.

Baker, L. (1984). Spontaneous versus instructed use of multiple standards for evaluating comprehension: Effects of age, reading proficiency, and type of standard. *Journal of Experimental Child Psychology*, **38**, 289-311.

Baker, L. (1984). Metacognitive skills and reading. In P.D. Pearson, M. Kamil, R. Barr and P. Mosenthal (Eds.), *Handbook of Reading Research*, Vol. 1, New York: Longman, 353-394.

Baker, L. and Brown, A. (1980). Metacognitive skills and reading. *(Tech. Rep .188). Urbana: University of Illinois, Centre for the Study of Reading.*

Baumann, J.F. (1982a). Research on children's main idea comprehension: A problem of ecological validity. *Reading Psychology*, **3**, 167-177.

Baumann, J.F. (1984). Effectiveness of a direct instruction paradigm for teaching main idea comprehension. *Reading Research Quarterly*, **20**, 93-108.

Baumann, J.F., Seifert-Kessell, N. and Jones, L.A. (1992). Effect of think-aloud instruction on elementary students' comprehension monitoring abilities. *Journal of Reading Behaviour*, **24**, 143-172.

Beck, I.L. (1985). Comprehension in the primary school. In J. Osborn, P. Wilson and R.C. Anderson (Eds.), *Reading Education: Foundations for a Literate America*, Lexington, MA: Lexington Books, 232-251.

Beers, T. (1987). Schema - theoretical models of reading - Humanising the machine. *Reading Research Quarterly*, **22**, 369-377.

Bereiter, C. and Bird, M. (1985). Use of thinking aloud in identification and teaching of reading comprehension strategies. *Cognition and Instruction*, **2**, 131-156.

Black, J.B. and Bower, G.H. (1980). Story understanding as problem solving. *Poetics*, **9**, 223-250.

Borkowski, J., Carr, M., Rellinger, E. and Pressley, M. (1991). Self-regulated cognition: Interdependence of metacognition, attributions, and self-esteem. In B.F. Jones and L. Idol (Eds.), *Dimensions of Thinking and Cognitive Instruction*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 53-92.

Brady, P.L. (1990). Improving the reading comprehension of middle school students through reciprocal teaching and semantic mapping strategies. Unpublished Ph.D., Boston University. Cited in B. Rosenshine and C. Meister (1994), Reciprocal teaching: A review. *Review of Educational Research*, **64**, 479-530.

Brown, A.L. (1978). Learning how to learn from reading. In J. Langer and M. Smith-Burke, *Reader Meets Author - Bridging the Gap*, DE: International Reading Association, 26-54.

Brown, A.L. (1980). Metacognitive development and reading. In R.J. Spiro, B.C. Bruce and W.F. Brewer (Eds.), *Theoretical Issues in Reading Comprehension*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 221-239.

Brown, A.L. (1987). Metacognition, executive control, self-regulation, and other more mysterious mechanisms. In E. Weinert, P. Rainer, and F, Kluwe (Eds.), *Metacognition, Motivation, and Understanding*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 65-116.

Brown, A.L. Armbruster, B.B. and Baker, L. (1986). The role of metacognition in reading and studying. In J. Orasanu (Ed.), *Reading Comprehension - From Research to Practice*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 49-75.

Brown, A.L, and Campione J.C. (1978). Permissible inferences from the outcome of training studies in cognitive development research. *Quarterly Newsletter of the Institute for Comparative Human Development*, **2**, 46-53.

Brown, A.L., Campione, J.C. and Barclay, C.R. (1979). Training self-checking routines for estimating test readiness: Generalisation from list learning to prose recall. *Child Development*, **50**, 501-512.

Brown, A.L., Campione, J.C. and Day, J.D. (1981). Learning to learn: On training students to learn from texts. *Educational Researcher*, **10**, 14-21.

Brown, A. and Ferrara, R.A. (1985). Diagnosing zones of proximal development. In J.V. Wertsch (Ed.), *Culture, Communication, and Cognition: Vygotskian Perspectives*, Cambridge: Harvard University Press, 28-49.

Brown,V., Hammill, D. and Wiederholt, J. (1978). *Test of Reading Comprehension*. Austin, TX: Pro-Ed.

Brown, A.L., Palincsar, A.S. and Armbruster, B.B. (1994). Instructing comprehension-fostering activities in interactive learning situations. Reprinted from H. Mandle, N.Stein, and T. Trabasso, *Learning and Comprehension of Text*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 757-787.

Brown, A.L. and Smiley, S. (1977). Rating the importance of structural units of prose passages: A problem of metacognitive development. *Child Development*, **48**, 1-8.

Bruce, M.E. and Chan, L.K. (1991). Reciprocal teaching and transenvironmental programming: A programme to facilitate the reading comprehension of students with reading difficulties. *Remedial and Special Education*, **12**, 44-54.

Bruner, J. (1972). Nature and uses of immaturity. *American Psychologist*, **27**, 687-708.

Burden, B. (1996). Pupil perception as themselves as thinkers, learners, and problem solvers: Some preliminary findings from 'Myself as Learner Scale' (MALS). *Educational and Child Psychology*, **13**, 25-30.

Burden, B. (1997). Theories of self-worth, self-esteem, and self-attribution. *British Educational Research Journal*, **19**, 332-384.

Burt Word Reading Test, 1974 Revision (1976). *Scottish Council for Research in Education*, London: Hodder and Stoughton Educational.

Canney, G. and Winograd, P. (1980). Schemata for reading and reading comprehension. Cited in P.J. Moore (1982). Children's metacognitive knowledge about reading: A selected review. *Educational Research*, **24**, 120-128.

Cavanaugh, J.C. and Perlmutter, M. (1982). Metamemory: a critical review. *Child Development*, **53**,11-28.

Chall, C.S. and Squire, P. (1991). Reading comprehension and the learning disabled reader. In P.D Pearson (Ed.), *Handbook of Reading Research*, New York: Longman, 356-401.

Chan, K.S. and Cole, P.G. (1986). The effects of comprehension monitoring training on the reading competence of learning disabled and normal students. *Remedial and Special Education*, **7**, 33-40.

Clark, Charles-H. (1996). Keys to successful cognitive and affective intervention with challenging students. *Reading and Writing Quarterly Overcoming Learning Difficulties*, **12**, 265-290.

Clay, M.M. (1967). The reading behaviour of 5 year old children: A research report. *New Zealand Journal of Educational Studies*, **2**, 11-31.

Clay, M.M. (1973). *Reading: The Patterning of Complex Behaviour.* Auckland, New Zealand: Heinemann.

Clay, M.M. (1979). *The Early Detection of Reading Difficulties.* Auckland, New Zealand: Heinemann.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational Psychological Measurement*, **20**, 37-46.

Collins, A., Brown, J.S. and Larkin, K.M. (1980). Inference in text understanding. In R.J Spiro, B.C. Bruce, and W.F. Brewer (Eds.), *Theoretical Issues in Reading Comprehension.* Hillsdale, New Jersey: Lawrence Erlbaum Associates, 385-407.

Cook, T.D. and Campbell, D.T. (1979). *Quasi-experimentation: Design and analysis for field settings*, **46**, Chicago: Rand McNally.

Covington, M.V. (1983). Motivated cognition. In S. Paris, G. Olson, and H. Stevenson (Eds.), *Learning and Motivation in the Classroom*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 139-164.

Covington, M.V. (1987). Achievement motivation, self attributions and exceptionality. In J.D. Day and J.G. Borkowski (Eds.), *Intelligence and Exceptionality: New directions for Theory, Assessment, and Instructional Practices*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 173-213.

Covington, M.V. (1992). *Making the Grade: A self-worth perspective on motivation and school reform.* New York: Cambridge University Press.

Cross, D.R. and Paris, S.A. (1988). Developmental and instructional analyses of children's metacognition and reading comprehension. *Journal of Educational Psychology*, **80**, 131-142.

Crowell, D.C., Au, K.H. and Blake, K.M. (1983). Comprehension questions: Differences among standardised tests. *Journal of Reading*, **26**, 314-319.

Cunningham, J.W. (1982). Generating interaction between schemata and text. In J.A. Niles and L.A. Harris (Eds.), *New Enquiries in Reading Research and Instruction*, Rochester, NY: National Reading Conference, 42-47.

Currie, L.A. (1990). English Language 5-14, novel studies and the development of metacomprehension skills. *Support for Learning*, **8**, 22-26.

Currie, L.A. (1997). Why use a novel? *Reading*, **31**, 11-16.

Curriculum and assessment in Scotland: A policy for the 90's, English Language 5-14 (1990). *Scottish Office Education Department*, Working paper No. 2.

Curriculum and assessment in Scotland National Guidelines, English Language 5-14 (1991). *Scottish Office Education Department.*

Day, J.D. (1986). Teaching summarisation skills: Influence of student ability level and strategy difficulty. *Cognition and Instruction*, **3**, 193-210.

Decker, B.C. and Sullivan, B.W. (1990). Metacognitive reading strategies for diploma seeking special educational students. *Journal of Instructional Psychology*, **17**, 107-117.

Dewey, J. (1910). *How We Think.* Boston: Heath.

Donaldson, M. (1978). Children's Minds. London: Fontana.

Downing, J. and Oliver, P. (1973-74). The childs' conception of a word. *Reading Research Quarterly*, **9**, 568-82.

Duffy, G., Roehler, L.R., Meloth, M.S., Vavrus, L.G., Book, C., Putnam, J. and Wesselman, R. (1986). The relationships between explicit verbal explanations during reading skill instruction and student awareness and achievement: A study of reading teacher effects. *Reading Research Quarterly*, **21**, 237-252.

Duffy, G., Roehler, L.R., Sivan, E., Rackliffe, B., Book, C., Meloth, M.S., Vavrus, L.G., Putnam, J., Bassiri, D. and Wesselman, R. (1987). Effects of explaining the reasoning associated with using reading strategies. *Reading Research Quarterly*, **22**, 347-368.

Durkin, D. (1978-1979). What classroom observations reveal about reading comprehension instruction. *Reading Research Quarterly*, **14**, 418-533.

Durkin, D. (1981). Reading comprehension instruction in five basal reader series. *Reading Research Quarterly*, **4**, 515-544.

Durkin, D. (1984). Is there a match between what elementary teachers do and what basal reader manuals recommend? *Reading Teacher*, **37**, 734-744.

Ehri, L. (1975). Word consciousness in readers and pre-readers. *Journal of Educational Psychology*, **67**, 204-212.

Ehrlich, Marie-France. (1991). Metacognition and reading comprehension: Theoretical and methodological problems. In M. Carretero, M. Pope, R.J. Simons and J. Pozo (Eds.), Vol. 3: *Learning and Instruction - European Research in an International Context*, Oxford: Pergamon, 351-363.

Farr, R., Carey, R. and Tone, B. (1980). Recent theory and research into the reading process: Implications for reading assessment. In J. Orasanu (Ed.), *Reading Comprehension - From Research to Practice.* Hillsdale, New Jersey: Lawrence Erlbaum Associates, 135-149.

Feitler, F.C. and Hellekson, L.E. (1993). Active verbalisation plus metacognitive awareness yields positive achievement gains in at-risk first graders. *Reading Research and Instruction*, **33**, 1-11.

Feurerstein, R. (1980). *Instrumental Enrichment.* Baltimore: University Park Press.

Fillmore, P. (1982). Children's reporting of miscues in teacher produced texts. Cited in R. Garner (1987), *Metacognition and Reading Comprehension.* Norwood, NJ: Ablex.

Flavell, J. H. (1971). First discussant's comments: What is memory development the development of? *Human Development*, **14**, 272-278.

Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. Resnick (Ed.), *The Nature of Intelligence.* Hillsdale, New Jersey: Lawrence Erlbaum Associates, 231-235.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, **34**, 906-911,

Flavell, J.H. (1981). Cognitive monitoring. In W.P. Dickson (Ed.), *Children's Oral Communication Skills*, New York: Academic Press, 35-60.

Flavell, J.H. (1985). *Cognitive development* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Flavell, J.H. (1987). Speculations about the nature and development of metacognition. In E. Weinert, P. Rainer and F. Kluwe, (Eds.), *Metacognition, Motivation and Understanding*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 21-29.

Flavell, J.H., Miller,P.H. and Miller, S.A. (1993). *Cognitive Development* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Fry, E. (1968). A readability formula that saves time. In J. Gilliland (Ed.), *Readability*, London: University of London Press, 100.

Gambrell, L. (1984). How much time do children spend reading during teacher-directed reading instruction? In J.A. Niles and L.A. Harris (Eds.), *Changing Perspectives on Reading/Language Processing and Instruction*, Rochester, NY: National Reading Conference, 193-198.

Gambrell, L. B. and Palmer, B.M. (1992). Children's metacognitive knowledge about reading and writing in literature-based and conventional classrooms. *National Reading Conference Yearbook*, **41**, 215-223.

Gardner, W.I. (1957/8). Reactions of intellectually normal and retarded boys after experimentally induced failure. Unpublished Ph.D. thesis. Cited in M.V. Covington, *Achievement Motivation, Self Attributions and Exceptionality*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 173-213.

Garner, R. (1987). *Metacognition and Reading Comprehension*. Norwood NJ: Ablex.

Garner, R. (1990). Children's use of strategies in reading. In David, F. Bjorklund (Ed.), *Children's Strategies - Contemporary Views of Cognitive Development*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 245-268.

Garner, R. and Alexander, P.A. (1989). Metacognition: Answered and unanswered questions. *Educational Psychologist*, **24**, 143-158.

Garner, R. and Kraus, C. (1982). Good and poor comprehenders' differences in knowing and regulating reading behaviours. *Educational Research Quarterly*, **6**, 5-12.

Garner, R. and Taylor, N. (1982). Monitoring of understanding. An investigation of attentional assistance needs at different grade and reading proficiency levels. *Reading Psychology*, **3**, 1-6.

Gavelek, J.R. and Raphael,T.E (1985). Metacognition, Instruction and the role of questioning activities. In D.L. Forrest-Pressley, G.E. MacKinnon and T.G. Walker (Eds.), *Metacognition, Cognition and Human Performance, Vol. 2: Instructional Practices,* New York: Academic Press, 103-132.

Gerjouy, I.R. and Spitz, H. (1966). Associative clustering in free recall: Intellectual and developmental variables. *American Journal of Mental Deficiency*, **70**, 918-927.

*Ginn Reading 360* (1986). London: Ginn.

Gordon, C.J. and Braun, C. (1985). Metacognitive processes: Reading and writing narrative discourse. In D.L. Forrest-Pressley, G.E. MacKinnon. and T. G. Walker (Eds.), *Metacognition, Cognition and Human Performance, Vol. 2: Instructional Practices,* New York: Academic Press, 1-72.

Grabe, M. and Mann, S. (1984). A technique for the assessment and training of comprehension monitoring skills. *Journal of Reading Behaviour*, **16**, 131-144.

Graesser, A.C. (1981). *Prose Comprehension Beyond the Word.* Berlin: Springer-Verlag.

Graves, A. (1986). Effects of direct instruction and metacomprehension training on finding main ideas. *Learning Disabilities Research*, **1**, 90-100.

Gruen, G., Ottinger, D. and Ollendick,T. (1978). Probability learning in retarded children with differing histories of success and failure in school. *American Journal of Mental Deficiency*, **79**, 417-423.

Hansen, J. (1981). The effects of inference training and practice on young children's reading comprehension. *Reading Research Quarterly*, **16**, 391-417.

Hansen, J. and Pearson, P.D. (1983). An Instructional study: Improving the inferential comprehension of good and poor fourth-grade readers. *Journal of Educational Psychology*, **75**, 821-829.

Hare, V.C. and Milligan, B. (1984). Main idea identification: Instructional explanations in four basal reader series. *Journal of Reading Behaviour*, **14**, 189-204.

Harter, S. (1980). *A Scale of Intrinsic Versus Extrinsic Orientation in the Classroom.* Denver: University of Denver.

Harter, S. (1982). The perceived competence scale for children. *Child Development*, **53**, 87-97.

Hieronymus, A.N., Lindquist, E.F. and Hoover, H.D. (1981). *Iowa Test of Basic Skills.* Boston, NY: Houghton Mifflin.

Holden, M. and MacGinitie, W. (1972). Children's conceptions of word boundaries in speech and print. *Journal of Educational Psychology*, **63**, 551-557.

Holt, J.H. (1964). *How Children Fail.* New York: Dell.

Iverson, S. and Tunmer, W. E. (1993). Phonological processing skills and the reading recovery program. *Journal of Educational Psychology*, **85**, 112-126.

Jacobs, J.E. and Paris, S.G. (1987). Children's metacognition about reading: Issues in definition, measurement, and instruction. *Educational Psychologist*, **22**, 255- 278.

Jenkins, J., Heliotis, J.D., Stein, M.L. and Haynes, M.C. (1987). Improving reading comprehension by using paragraph restatements. *Exceptional Children*, **54**, 54-59.

Johns, J. (1979). Beginning reading: Fusing research and instruction. *Australian Journal of Reading*, **2**, 188-196.

Johns, J. and Ellis, D. (1976). Reading: Children tell it like it is. *Reading World*, **16**, 115-28.

Johnston, P. and Afflerbach,P. (1985). The process of constructing main ideas from text. *Cognition and Instruction*, **2**, 207-232.

Kavale, K. and Schreiner, R. (1979). The reading processes of above average and average readers: A comparison of the use of reasoning strategies in responding to standardised comprehension measures. *Reading Research Quarterly*, **15**, 102-128.

Kelly, G.A. (1955). *The Psychology of Personal Constructs.* New York: Norton.

Kendall, J.R. and Mason, J.M. (1982). Metacognition from the historical context of teaching. *Topics in Learning and Learning Disabilities*, **2**, 82-89.

Kerlinger, F.N. (1979). *Foundations of Behavioural Research, (2nd ed.).* London: Holt-Saunders.

King-Smith, D. (1978). *The Fox Busters.* London: Puffin.

Kirk, R.E. (1968). *Experimental Design: Procedures for the Behavioural Sciences.* Belmont, California: Wadsworth Publishing.

Kobasigawa, A., Ransom, C.C. and Holland, C.J. (1980). Children's knowledge about skimming. *Alberta Journal of Educational Research*, **26**, 169-182.

Kurtz-Costes, B., Ehrlich, Marie-France., McCall, R. and Loridant, C. (1995). Motivational determinants of reading comprehension: A comparison of French, Caucasian-American, and African adolescents. *Applied Cognitive Psychology*, **9**, 351-364.

Leach, C. (1979). *Introduction to Statistics - A Non Parametric Approach for the Social Scientists.* London: John Wiley and Sons.

Lee, W. (1975). *Experimental Design and Analysis.* San Francisco: Freeman.

Lundberg, L. and Torneus, M. (1978). Non readers' awareness of the basic relationship between spoken and written words. *Journal of Experimental Child Psychology*, **25**, 202-212.

Lysynchuk, L. M., Pressley, M. and Vye, N. J. (1990). Reciprocal teaching improves standardised reading comprehension performance in poor comprehenders. *Elementary School Journal*, **90**, 471-470.

MacGinitie, W.G. (1978). *Gates MacGinitie Reading Tests.* Boston: Houghton-Mifflin.

McLeod, J. (1970). *GAP Reading Comprehension.* London: Heinemann.

McLeod, J. and Anderson, J. (1970). An approach to the assessment of reading through information transmissions. *Journal of Reading Behaviour*, **2**, 116-143.

McLeod, J. and Anderson, J. (1973). *GAPADOL Reading Comprehension.* London: Heinemann.

Malone, L.D. and Mastropieri, M.A. (1992). Reading comprehension instruction: Summarisation and self-monitoring training for students with learning disabilities. *Exceptional Children*, **58**, 270-279.

Mandler, J.M. and Johnson, N.S. (1977). Remembrance of things parsed: Story structure and recall. *Cognitive Psychology*, **9**, 111-151.

Markman, E.M. (1977). Realizing that you don't understand: A preliminary investigation. *Child Development*, **48**, 986-992.

Markman, E.M. (1979). Realizing that you don't understand: Elementary school children's awareness of inconsistencies. *Child Development*, **50**, 643-655.

Markman, E.M. (1981). Comprehension monitoring: Developmental and Educational Issues. In W.P. Dickson (Ed.), *Children's Oral Communication Skills.* New York: Academic Press, 275-291.

Marshall, J.C. and Morton, J. (1978). On the mechanics of EMMA. In A. Sinclair, R.J. Jarvella and W.J.M. Levelt (Eds.), *The Child's Conception of Language*, Berlin: Springer-Verlag, 64-78.

Mateos, M. and Alonso, J. (1991). Metacognition and reading comprehension: Strategies for comprehension monitoring and training. In M. Carretero, M. Pope, R.J. Simons and J. Pozo (Eds.), *Vol. 3: Learning and Instruction - European Research in an International Context*, Oxford: Pergamon, 273-292.

Mattingly, I. (1972). Reading, the linguistic process, and linguistic awareness. In J. Kavanagh, and I. Mattingly, (Eds.), *Language by Ear and by Eye*, Cambridge, Mass: Mit Press, 133-157.

Miyake, N. and Norman, D.A. (1979). To ask a question one must know enough to know what is not known. *Journal of Verbal Learning and Verbal Behaviour*, **18**, 351-364.

Moore, P.J. (1982). Children's metacognitive knowledge about reading: A selected review. *Educational Research*, **24**, 120-128.

Moore, P.J. and Kirkby, J. (1981). Metacognition and reading performance: A replication and extension of Myers and Paris in an Australian context. *Educational Enquiry*, **4**, 18-29.

Mulholland, H. and Neville, M. (1989). Reading and listening at three school stages: Cloze tests and their response analysis. *Journal of Research in Reading*, **12**, 29-48.

Murphy, J, (1974). *The Worst Witch.* London: Puffin.

Myers, M. and Paris, S.G. (1978). Children's metacognitive knowledge about reading. *Journal of Educational Psychology*, **70**, 680-690.

Neale, Marie, D. (1989). *Neale Analysis of Reading Ability - Revised British Edition.* Windsor: NFER-Nelson.

Nisbet, J. and Shucksmith, J. (1986). *Learning Strategies.* London: Routledge and Kegan Paul.

Oakhill, J. (1984). Inferential and memory skills in children's comprehension of stories. *British Journal of Educational Psychology*, **54**, 31-39.

Oakhill, J. (1995). Working memory or failure to understand? Paper given at the *Conference of the Developmental Section, British Psychological Society, Strathclyde University.*

Omanson, R. C. (1982a). An analysis of narratives: Identifying central, supportive, and distracting content. *Discourse Processes*, **5**, 195-224.

Orasanu, J. and Penney, M. (1986). Introduction: comprehension theory and how it grew. In J. Orasanu (Ed.), *Reading Comprehension from Research to Practice*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1-9.

O'Sullivan, J.and Joy, R. (1994). If at first you don't succeed: Children's metacognition about reading problems. *Contemporary Educational Psychology*, **19**, 118-127.

Oxford Reading Tree. (1987). Oxford: Oxford University Press.

Palincsar, A.S. (1982). Improving the reading comprehension of junior high students through the reciprocal teaching of comprehension-monitoring strategies. Unpublished Ph.D. dissertation. Cited in A.S. Palincsar, and A.L. Brown, (1984). Reciprocal teaching of comprehension fostering and comprehension monitoring activities. *Cognition and Instruction*, **1**, 117-175.

Palincsar, A.S. and Brown, A.L. (1982). Reciprocal teaching: a means to a meaningful end. In J. Osborn, P. Wilson and R.C. Anderson (Eds.), *Reading Education: Foundations for a Literate America*, Lexington: Lexington Books, 299-310.

Palincsar, A.S. and Brown, A.L. (1984). Reciprocal teaching of comprehension fostering and comprehension monitoring activities. *Cognition and Instruction*, **1**, 117-175.

Palincsar, A.S., Brown, A.L. and Martin, S.M. (1987). Peer interaction in reading comprehension instruction. *Cognition and Instruction*, **1**, 117-175.

Paris, Scott. G. (1986). Teaching children to guide their reading and learning. In T. Raphael, *Contexts and School Based Literacy*, New York: Random House, 115-130.

Paris, Scott. G. (1991). Assessment and remediation of metacognitive aspects of children's reading comprehension. In *Topics in Language Disorders*, NY: Aspen, **12**, 32-50.

Paris, Scott. G., Calfee, R.C., Filby, N., Hiebert, E.H., Pearson, D.P., Valencia, S.W. and Wolf, K.P. (1992). A framework for authentic literacy assessment. *The Reading Teacher*, **46**, 88-98.

Paris, Scott. G, Cross, D.R. and Lipson, M.Y. (1984). Informed strategies for learning: A programme to improve children's reading awareness and comprehension. *Journal of Educational Psychology*, **76**, 1239-1252.

Paris, Scott. G. and Jacobs, J.E. (1984). The benefits of informed instruction for children's reading awareness and comprehension skills. *Child Development*, **55**, 2083-2093.

Paris, Scott. G. Lipson, M.Y. and Wixson, K.K. (1983). Becoming a strategic reader. *Contemporary Educational Psychology*, **8**, 293-316.

Paris, Scott. G. and Myers M. II. (1981,a,b). Comprehension monitoring, memory, and study strategies of good and poor readers. *Journal of Reading Behaviour*, **XIII**, 5-22.

Paris, Scott. G., Newman, R.S. and McVey, K.A. (1982). Learning the functional significance of mnemonic actions: A microgenetic study of strategy acquisition. *Journal of Experimental Child Psychology*, **34**, 490-509.

Paris, Scott. G. and Oka, E.R. (1986). Children's reading strategies, metacognition and motivation. *Developmental Review*, **6**, 25-56.

Paris, Scott. G., Saarino, D.A. and Cross, D.R. (1986). A metacognitive curriculum to improve children's reading and learning. *Australian Journal of Psychology*, **38**, 107-123.

Paris, Scott. G., Wasik, B.A. and Turner, J.C. (1991). The development of strategic readers. In P.D. Pearson (Ed.), *Handbook of Reading Research* (2nd. ed.), New York: Longman, 143-166.

Paris, Scott. G., Wasik, B.A and van der Westhuizen, G. (1988). Meta-metacognition: A review of metacognition and reading. In J. Readance and S. Baldwin (Eds.), *Dialogues on Literacy Research*, Chicago, IL: National Reading Conference, 143-166.

Paris, Scott. G. and Winograd, P.W. (1990). How metacognition can promote academic learning and instruction. In B.J. Jones and L. Idol (Eds.), *Dimensions of Thinking and Cognitive Instruction*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 15-51.

Paris, Scott. G., Wixson, K.K. and Palincsar, A.S. (1986). Instructional approaches to reading comprehension. In E. Rothkopf (Ed.), *Review of Research in Education*, **14**, 91-128.

Pearson, P. David and Fielding, L. (1991). Comprehension instruction. In P.D Pearson (Ed.), *Handbook of Reading Research*, New York: Longman, 815-860.

Pearson, P. David and Gallagher, M.C. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology*, **8**, 317-344.

Pearson, P., Hansen, J. and Gordon, C. (1979). The effect of background knowledge on young children's comprehension of explicit and implicit information. *Journal of Reading Behaviour*, **11**, 201-210.

Pearson, P. David and Johnson, Dale D. (1978). *Teaching Reading Comprehension*. New York: Holt, Rinehart and Winston.

Pickens, J. and McNaughton, S. (1988). Peer tutoring of comprehension strategies. *Educational Psychology*, **8**, 67-79.

Pintrich, P.R., Anderman, E.M. and Klobucar, C. (1994). Intraindividual differences in motivation and cognition in students with and without learning disabilities. *Journal of Learning Disabilities*, **27**, 360-370.

Pressley, M. and Woloshyn, V.E. (1995). *Cognitive Strategy Instruction* (2nd ed.). Cambridge MA: Brookline.

Puntambekar, S. (1995). Helping students learn "how to learn" from texts: Towards an ITS for developing metacognition. *Instructional Science*, **23**, 163-182.

Purves, A. (1985). That sunny dome: Those caves of ice. In C R. Cooper (Ed.), *Researching Response to Literature and the Teaching of Literature: Points of Departure*, Norwood, NJ: Ablex, 54-69.

Raphael, T. E. and McKinney, J. (1983) An examination of fifth and eighth grade children's question answering behaviour: An instructional study in metacognition. *Journal of Reading Behaviour*, **14**, 67-86.

Raphael, T. E. and Pearson, P. D. (1985). Increasing students' awareness of sources of information for answering questions. *American Educational Research Journal*, **22**, 217-235.

*Reading 2000*. (1986). London: Oliver and Boyd.

Reid, J.F. (1966). Learning to think about reading. *Educational Research*, **9**, 56-62.

Resnick, L.B. (1983). Toward a cognitive theory of instruction. In S. Paris, G., Olson and H. Stevenson (Eds.), *Learning and Motivation in the Classroom*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 231-267.

Rinehart, S.D., Stahl, S. A. and Erickson, L. G. (1986). Some effects of summarisation training on reading and studying. *Reading Research Quarterly*, **21**, 422-438.

Robson, C. (1993). *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. Oxford: Blackwell.

Roehler, L.R. and Duffy, G.G. (1984). Direct explanation of comprehension processes. In G. Duffy, L. Roehler, and J. Mason (Eds.), *Comprehension Instruction: Perspectives and Suggestions*, New York: Longman, 265-280.

Rogoff, B. and Gardner, W.P. (1984). Adult guidance of cognitive development. In B. Rogoff and J.Lave (Eds.), *Everyday Cognition: Its Development in a Social Context*, Cambridge, Nass: Harvard University Press, 95-116.

Rogoff, B. and Wertsch, J.V. (1984). Children's learning in the "zone of proximal development". *New Directions For Child Development*, **23**, 93-99.

Rosenshine, B. and Meister, C. (1994). Reciprocal teaching: A review. *Review of Educational Research*, **64**, 479-530.

Rude, R.T. and Oehlkers,W.J. (1984). *Helping Children with Reading Problems*. Englewood Cliffs, NJ: Prentice Hall.

Rumelhart, D.E. (1975). Notes on a schema for stories. In D.G. Brown and A. Colins (Eds.), *Representation and Understanding: Studies in Cognitive Science*, New York: Academic Press, 211-236.

Rumelhart, D.E. and Ortony, A. (1977). The representation of knowledge in memory. In R.C. Anderson, R.J. Spiro and W.E. Montague. (Eds.), *Schooling and the Acquisition of Knowledge*, Hillsdale, New Jersey: Lawrence Erlbaum Associates, 181-201.

Seligman, M.E.P. (1975). *Helplessnes*s. San Francisco: Freeman.

Schmitt, M.C. and Baumann, J.F. (1990). Metacomprehension during reader instruction: Do teachers promote it? *Reading Research and Instruction*, **29**, 1-13.

Schunk, D. H. and Rice, J. H. (1987). Enhancing comprehension skill and self-efficacy with strategy value information. *Journal of Reading Behaviour*, **3**, 285-302.

Siegel, S. (1956). *Non-Parametric Statistics for the Behavioural Sciences*. New York: McGraw-Hill.

Silven, M. (1991). The multiple role of metacognition in teaching children to understand and learn from texts: The effects of thinking aloud on the acquisition and transfer of training. *Licentiate thesis*. Finland: University of Turku.

Silven, M. (1992). The role of metacognition in reading instruction. *Scandinavian Journal of Educational Research*, **36**, 211-221.

Singer, H. (1978). Active comprehension from answering to asking questions. *Reading Teacher*, **31**, 901-908.

Smith, R.J. and Barrett, T.C. (1979). *Teaching Reading in the Middle Grades*, (2nd ed). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Spache, G.E. (1972). *Diagnostic Reading Scales*, (2nd ed). New York: McGraw-Hill.

Spires, H. (1990). Metacognition and reading: Implications for research. *Reading*, **24**, 151-157.

Stein, N.L. and Glenn, C.G. (1979). An analysis of story comprehension in elementary school children. In R.O. Freedle (Ed.), *New Directions in Discourse Processing*, Norwood, NJ: Ablex, 53-120.

Taylor, M.M. and Frye, B.J. (1992). Comprehension strategy instruction in the intermediate grades. *Reading Research and Instruction*, **92**, 39-48.

Teale, W.H. (1988). Developmentally appropriate assessment of reading and writing in the early childhood classroom. *The Elementary School Journal*, **89**, 173-183.

Thomson, D. (1966). *Danny Fox*. London: Puffin.

Thorndike, E.L. (1917). Reading as reasoning: A study of mistakes in paragraph reading. *Journal of Educational Psychology*, **8**, 323-332.

Thorpe, K.J. and Satterly, D.J.H. (1990). The Development and inter-relationship of metacognitive components among primary school children. *Educational Psychology*, **10**, 5-21.

Tolmie, A., Howe, C.J., Mackenzie, M. and Greer, K. (1993). Task design as an influence on dialogue and learning: Primary school group work with flotation. *Social Development*, **2**, 183-201.

Top, B.L. and Osguthorpe, R.T. (1987). Reverse-role tutoring: The effects of handicapped students tutoring regular class students. *Elementary School Journal*, **87**, 413-423.

Topping, K.J. (1988). *The Peer Tutoring Handbook: Promoting Co-operative Learning*. Beckenham: Croom Helm/Cambridge, MA: Brookline.

Topping, K.J. and Whiteley, M. (1990). Participant evaluation of parent-tutored and peer-tutored projects in reading. *Educational Research* , **32**, 14-32.

Tizard, B. (1974). *Pre-school Education in Great Britain: A Research Review.* London: Social Science Research Council.

Vincent, D., De la Mare, M. (1985). *The New Reading Analysis.* Windsor: NFER-Nelson

Vygotsky, L.S. (1978). *Mind in Society: The Development of Higher Psychological Processes.* Cambridge, Mass: Harvard University Press.

Ward, L. and Traweek, D. (1993). Application of a metacognitive strategy to assessment, intervention, and consultation: A think aloud technique. *Journal of School Psychology,* **31**, 469-485.

Weber, R.M. (1970). A linguistic analysis of first grade reading errors. *Reading Research Quarterly,* **5**, 427-451.

Weinert, E., Rainer, P. and Kluwe, F. (1987). *Metacognition, Motivation and Understanding.* Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Wellman, H.M. (1983). Metamemory revisited. *Contribution to Human Development,* **9,** 31-51.

Wertsch, James.V. (1991). *Voices of the Mind.* Cambridge: Harvard University Press.

Wertsch, James. V. (1985). *Vygotsky and the Social Formation of Mind.* Cambridge: Harvard University Press.

Wilson, P.T. and Anderson, R.C. (1987). What they don't know will hurt them: The role of prior knowledge in comprehension. In J. Orasanu, (Ed.),*Reading Comprehension - From Research to Practice,* Hillsdale, New Jersey: Lawrence Erlbaum Associates, 31-48.

Winograd, P. and Hare, V.C. (1988). Direct instruction of reading comprehension strategies: The nature of teacher explanation. *Learning and Study Strategies: Issues in Assessment, Instruction, and Evaluation,* San Diego: Academic Press, 121-139.

Winograd, P. and Johnston, P. (1987). Some considerations for advancing the teaching of reading comprehension. *Educational Psychologist,* **22,** 213-230.

Wixson, K.K. (1983). Postreading question-answer interactions and children's learning from text. *Journal of Educational Psychology*, **30**, 413-423.

Wong, B.Y.L. and Jones, W. (1982). Increasing metacomprehension in learning disabled and normally achieving students through self-questioning training. *Learning Disability Quarterly*, **5**, 228-240.

Woodcock, R.W. (1987). *Woodcock Reading Mastery Test*. Circle Pines, MN: American Guidance Service.

Wray, D. (1994). Comprehension monitoring, metacognition and other mysterious processes. *Support for Learning*, **9**, 107-113.

Wright, J. and Cashden, A. (1991). Training metacognitive skills in backward readers: A pilot study. *Educational Psychology in Practice*, **7**, 153-162.

Wylie, R.C. (1961). *The Self-Concept*. Lincoln: University of Nebraska Press.

Youngman, M. B. (1979). *Analysing Social and Educational Research Data*. London, UK: McGraw-Hill.

Yuill, N. and Oakhill, J. (1988). Effects of inference awareness training on poor reading comprehension. *Applied Cognitive Psychology*, **2**, 33-45.

# APPENDICES

The Snowman

It was winter. Snow lay thick on all the houses, trees and bushes. Linda and John had never seen so much snow. They couldn't wait to go out and play in it. They rushed through their breakfast, talking about their plans for the day. They had a sledge made out of a tea-tray, which they decided to save for the afternoon. They would spend the morning snowballing in the garden, and building a snowman. They put on their warmest jumpers and their fur-lined boots and hurried outside.

The snow was just right for making snowballs. They had to take their gloves off to roll them. Then their fingers got so icy that they tingled. Soon they were throwing snowballs at each other from the piles they had made. Linda was hit in the eye, but she only laughed. The snow was soft enough not to hurt. The children threw snowballs at the dog, the lady next door, and the milkman. Nobody seemed to mind. Then, tired, they looked around for a good place to build a snowman.

"That's funny", said Linda. "There's a snowman just outside our gate, and I didn't see anybody making it."

They ran up to the snowman and looked at it. It was well made. It had two snow legs, two snow arms, a blue hat, and a scarf round its neck. Its eyes looked like black diamonds, and it had a pipe in its mouth. As they watched, a puff of smoke came from the pipe. Then another and another.





"Snowmen can't really smoke," said John. He was very good at knowing what was possible and what was impossible. The two children looked at it more closely. The smoke blew across the snowman's face, and melted the snow. The snowman puffed harder at his pipe. More snow melted. Soon his blue hat fell off. The snow had become too soft to hold it. Then the pipe fell to the ground and the snowman's head dissolved into water. There was nobody there. But who had been puffing at the pipe?

Linda and John do not know to this day.

# Children to the Rescue

Once upon a time there were two children called Tom and Meg. They liked playing games. They liked drawing and painting. They loved swimming. They did not like helping in the house or the garden.

One day they went out for a drive with Mum and Dad. When they got back Mum looked for her door-key.

'Oh dear,' she said, 'I must have left it in the kitchen. Open the door with your key, Dad.'

Dad looked slightly upset.

'Mine is indoors as well,' he said.

All the big windows were shut.

'Whatever shall we do?' asked Mum.

Meg ran round the back. She found a little window upstairs which was open.

'That's much too small for me to get in,' said Dad.

'And for me,' said Mum.

'I know,' Tom suggested, 'I will climb on Dad's back. Then Meg can climb on my back. We might just reach the window. Meg is the only one small enough to get in.'

It was fun. Tom fell off Dad's back once, and Meg kicked Dad (by accident, of course). She fell off Tom's back twice. At last she clambered up on his shoulders. She found that she could just reach the window. She pulled herself up and climbed into the room. They were all pleased when she opened the front door to let them in.

'We like that sort of helping,' said the children. 'It was a great adventure.'

'Let's have a cup of tea,' said Mum.

# Whatever happened to Jack?

The sun was blazing hot as Jack dived into the water from a high rock. He was a good swimmer, and Liz found that she could not keep up with him. She swam as quickly as she could across the bay to reach him. Suddenly she realised that she couldn't see him any longer. He couldn't have got out of sight so quickly! There were some bubbles on the water. Liz thought he must have dived under the water to tease her, and felt very upset and cross. Then a little head appeared where the bubbles were; it was green and slimy with big pop-out eyes. It made a strange gulping sound and then spoke. The voice sounded just like Jack's, but the words were different from any that she had ever heard before.

'Glomp, swolk, bub, bub, glomp,' said the head with Jack's voice. Liz didn't know what to do. She was half frightened and half angry.

'Don't tease me, Jack,' she said. 'Come up from under the water.' But his voice really was coming from the strange animal's mouth. She put out her hand to touch it, but it had gone under the water again, with just the bubbles left to show that something was breathing.

Liz started to swim back to the rock, swallowing water because she was frightened and couldn't breathe properly. She pulled herself up on to the dry grass at the top of the rock. Jack was there already! He, too, looked very frightened.

'What happened? Where were you?' panted Liz.

'When I got out there I felt something pulling at my leg. It pulled me right down into the water. It was all dark, and there was a rushing in my ears. But I could breathe quite well. It was funny. I began to feel like someone else. I couldn't remember who I was. I seemed to get smaller, and my skin felt all loose. I felt I wanted to swim around there for ever. I even felt like catching a little fish in my mouth and eating it. It was good fun; for a time my arms felt like flippers, and I thought I'd stay there.'

'What happened then?' asked Liz, trying to believe that he was making it all up.

'I heard your voice calling me. It was very far away, but I heard it. I thought you sounded frightened, so I swam under water to the rock, because I thought you would be there. When I climbed out I saw you swimming towards me, and I knew that I was myself again.'

Liz and Jack gazed across the bay, but it was as smooth and clear as glass. Neither of them could think of any explanation. They smiled at each other, packed their gear, and trudged back to the house.

## What Ever Happened to Jack?: post-test: Above average

## Question Generating Passages: Pilot Study

# The House in the Wood

It was dark in the wood. Richard and Ruth tried to keep cheerful, but their picnic basket seemed very heavy. Champ, their terrier, was happy, though. He liked all the scents, and kept rushing backwards and forwards making excited little yelps.

'Wait a minute. I want a rest,' panted Ruth. They put the basket down and sat down on an old tree stump.

'Are you all right?' Richard said, after a minute or two. 'We'd better get going. Champ, where are you?'

Champ had disappeared. The two children hunted everywhere. Then they found a hole under the tree-trunk, and in the mud they could see fresh paw-marks. Champ must have gone down the hole. There was no sign of him now.

'We'll walk on a bit. He is sure to come after us. We will go on calling him.' Ruth picked up the picnic basket and started walking.

They seemed to go on for hours, calling all the time. Ruth started to cry. Just then they came to an open space in the wood. In the clearing was a little house. The windows were covered with cobwebs and were tightly shut. The door was locked with a rusty old padlock. Leaves covered the roof and hung down over the windows. Nobody could have been near it for years. There were no footmarks in the mud round the door.

The children sat down and opened their picnic basket. The food made them feel a little better.

'What's that noise?' said Richard. They could hear whining, and then a soft bark. The barking was coming from inside the house! They could find no way in. Everything was still locked. But the barking was coming from inside, they were sure.

'We shall have to break in,' decided Ruth. Richard found a big stone, and broke one of the little windows. The hole was just big enough for a dog to jump through. A minute later Champ charged through the hole. He landed, panting and whimpering, on top of the picnic basket. He stayed very close to the children all the way home.

'Perhaps there was a secret passage from the hole to the house?'

They would never know. Only Champ knew, and he wasn't telling.

## The House in the Wood: post-test: Below average readers

# Appendix 1b:

## Test materials for Comprehension measure: Pilot study

# High Life

Mike was thrilled when the family moved to the tenth floor of a high-rise block of flats. He could see the play-area far below, and beyond that the streets of the city like a gigantic spider's web. On the third day after their move he noticed a small black shape outside the window. It was rectangular, a metallic box with two steely feelers standing out like antlers. It rotated ceaselessly on its axis, poised always within his range of vision.

'What is it, Dad? It's making a sort of humming noise.' The high-pitched squeaks came in a series of long and short notes, rather like Morse Code.

'Can't see anything, lad,' Dad said, peering out short-sightedly. 'Where are my glasses?' Even with his glasses on he could not see or hear anything. Mum came over: 'There's nothing there – talk about having your head in the clouds!'

Pat, Mike's sister, wandered in, half asleep. She had the sharpest eyes of all, but she swore she could see nothing but 'mucky old sky, and boring old clouds!'

Mike was sure that, if he listened intently, he would get the message. The black shape mesmerised him with its slow-motion rhythm.

It came to him gradually. The first word he recognised – how he did not know – as 'COME.' It began a little phrase of bleeps, repeated endlessly. 'COME – bleep – bleep – bleep – *bleep*,' it went, like the song of a rusty mechanical bird. Next came the final words: 'TO ME.' So the phrase seemed to mean: 'COME – bleep – bleep – TO ME.'

Suddenly the box whirled round much faster. The phrase was repeated more urgently. He understood it all. 'COME – FLY – UP – TO – ME' went the supersonic bleeps, over and over again, piercing his ear-drums.

Mike opened the window and climbed out, standing framed in the space, holding on to the curtains for balance. He would fly . . .

'Mike! Whatever are you doing? Get down at once! Pat, Pat, come quickly!' Arms grabbed him and pulled him back into the room. He landed uncomfortably on the floor, with Mum's red, anxious face glowering above him. He clambered up, bruised and panting. He looked out of the window. The box had disappeared. His head was empty of rhythms and messages. He felt sad; it was as if he had let someone down badly, but already he was forgetting who or what.

The local paper carried a small headline that evening: 'An unidentified flying object was to be seen over the Blackwater flats this morning. It appeared to crash to earth at approximately eight a.m.'

## The High Life: pre-test: Above average readers

# The High Life

1. What was the name of the boy in the story?

2. What did Mike notice on the third day after the family's move of house?

3. Who wandered in half asleep?

4. What did Mike's sister say she saw?

5. What did the supersonic bleeps say?

6. What did Mike's Mum think of his claims at seeing a strange object and hearing funny noises?

7. What would have happened if Mike had been on his own that night?

8. How do you think Mike's mum and dad felt when they pulled him down from the window?

9. Why did nobody else in the family see the strange object?

10. Was Mike dreaming? (Why)

**Pre-test: Above average readers**

# Girl in the Sand

Class Four were all set for their annual trip to the coast. The coach-trip took two hours, and when they arrived the children couldn't wait to rush down to the beach. They had eaten all their sandwiches on the way, but it didn't matter, as there were more exciting things to do here, like looking for baby crabs in the mysteriously deep rock pools, playing hide-and-seek in the sand-dunes, and splashing each other in the huge icy breakers.

Sandra Black was the only one who didn't seem to be enjoying it. She moaned that it was too hot, she moaned that all her food was gone, she moaned that nobody would play with her. She was always moaning at school, so the rest of the class were used to it. Simon and Tony decided that it was time to teach her a lesson.

'Come on, Sandra, we'll go for a walk with you,' they yelled, starting off at a brisk jog to the nearest dune. Sandra puffed after them, calling them to wait for her in her usual complaining tone.

'We'll cover you with sand, Sandra – it's a good game.'

Sandra lay down and let them scoop sand all over her till she looked like a little sand-dune, with just her head and two toes sticking out. She liked the attention, and the feeling of being covered with sand, and closed her eyes sleepily. The two wicked boys ran off, saying nothing about Sandra when they got back to the rest of the class. Mrs Smith, weary and irritable at the end of a long afternoon, began to herd the children together to return to the coach.

'Where's Sandra?' she asked.

Sandra was nowhere to be seen. The boys were terrified; perhaps she was smothered by the sand. They avoided Mrs Smith and raced back to the dunes, but there was no Sandra! Only a pile of overturned sand and a hair-ribbon, showing that she had, indeed, been there. The joke didn't seem funny any more.

'We'd better go back to the coach and phone the police from the restaurant.' Mrs Smith looked fierce, several girls were in tears, and Simon and Tony kept very quiet.

The gloomy party trudged towards the coach. There was a little face at the window, and they all looked at each other in relief. Yes, it was Sandra, who said not a word about what had happened. Simon and Tony realised how wrong they had been about her, and were always nice to her after that, while Sandra never moaned quite as much again.

## Girl in the Sand: Post-test: Above average readers

# Girl in the Sand

1. What was the name of the girl in the story?

2. What was Sandra always doing at school?

3. What did Simon and Tony decide it was time to do?

4. Why was it dangerous to cover Sandra in sand?

5. How do you think Sandra felt when she discovered she was left alone?

6. Where did the boys race back to?

7. What did the boys think had happened to Sandra when they found her ribbon and a pile of overturned sand?

8. Whom did Mrs. Smith decide to phone from the restaurant?

9. Why do you think Sandra didn't say anything about being covered in sand?

10. Why was the party gloomy?

**Post-test: above average readers**

**Comprehension Passages and Questions: Pilot Study**

# Fred Frog

Once there was a little frog. His name was Fred. He lived in a pond. All the big frogs could jump. Fred couldn't jump. His back legs were too short to jump.

Fred could dive into the pool, though. He stood on a stone and dived into the water. He swam round in the pond. He tried to jump out. It was no good. He climbed out slowly.

Fred lay on his back and waved his legs in the air. Then he tried again. It was still no good.

'Climb on my back,' said a great big frog. Fred did what the big frog told him. He tried to jump off the big frog's back. He slipped off into the water. He still could not jump.

'You are too little to jump,' said the big frog. 'When you get big it will be easy.'

Fred had to put up with swimming and diving for a long time. One day he tried again. He stood on the stone.

He took a deep breath.

He jumped.

He jumped right up in the air.

Fred was a big frog now!

'I am Fred the jumper,' he said.

**Fred Frog pre-test: Below average readers**

# Fred Frog

1. What was the frog's name?

2. Could the frog jump?

3. What did the frog stand on to dive into the water?

4. What did Fred wave in the air?

5. What did Fred have to put up with?

6. How do you think Fred felt not being able to jump (WHY)?

7. Why do you think Fred lay on his back and waved his legs in the air?

8. Why did the big frog tell Fred to climb onto his back?

9. Do you think Fred tried hard enough to learn how to jump?

10. How do you know that Fred had grown up into a big frog?

**Pre-test: below average readers**

**Comprehension Passages and Questions: Pilot Study**

# The Bad Dogs

Once there were two dogs. They lived in the same village. One was called Spot. The other was called Lassie. They liked each other. They went for runs on their own. One hot day they went for a long run. They ran and ran. They came to a field. They sniffed new smells. They saw some white animals. They could tell that they were not dogs. They ran round and round the animals. The animals made silly noises. The noises sounded like '*Baa-baa*'. They were sheep.

Spot said, 'We will chase the silly animals out of the field.' So they did. The sheep were frightened. Spot and Lassie barked loudly. They felt very clever. They thought the sheep were silly.

Then Lassie stood still. Her ears went up. 'A man is coming. He has a big stick.' It was not a stick. It was a gun. The man held the gun in the air. It went 'Bang! Bang!'

Lassie and Spot ran and ran. Their tails hung down. They were shaking. They were very scared. They got home at last.

'We will never chase sheep again,' they said. They were very glad to be safe at home.

***The Bad Dogs: Post-test: Below average readers***

# The Bad Dogs

1. How many dogs were there?
2. What were the dogs called?
3. What did the dogs see in the field?
4. What did the man hold up in the air?
5. What did Spot and Lassie decide never to do again?
6. Do you think the dogs were clever (WHY?)
7. How did Spot and Lassie know that the white animals were not dogs?
8. Who do you think the man with the gun was?
9. Why were the dogs scared?
10. Do you think Spot and Lassie were old dogs (WHY)?

**Post-test: below average readers**

# Appendix 2a:

## Workshop materials: Activities 1 to 4

# Activity 1: A starting point

## Instructions

This is a short activity designed to start us thinking about our teaching of comprehension skills and to begin to explore our own behaviour as readers.

1. Individually, think about each of the questions posed.

2. Having thought about how and what you would answer, discuss each question as a group and provide a summary of the groups deliberations for each question.

**Be prepared to feedback to the whole group if requested**

Laura-Ann Currie

# Activity 2: Exploring Our own reading behaviour

## Instructions

1. Individually, read the passage provided.
2. As a group think about the following questions:

> **What was your initial reaction to the passage?**
>
> **Given your initial reaction, what did you find yourself doing?**
> *(You may have to read a part of the passage again to answer this question. You are being asked to introspect (look into) your behaviour whilst reading).*

3. Write down everything which the group has thought of in relation to the above two questions.

**Be prepared to feedback to the whole group**

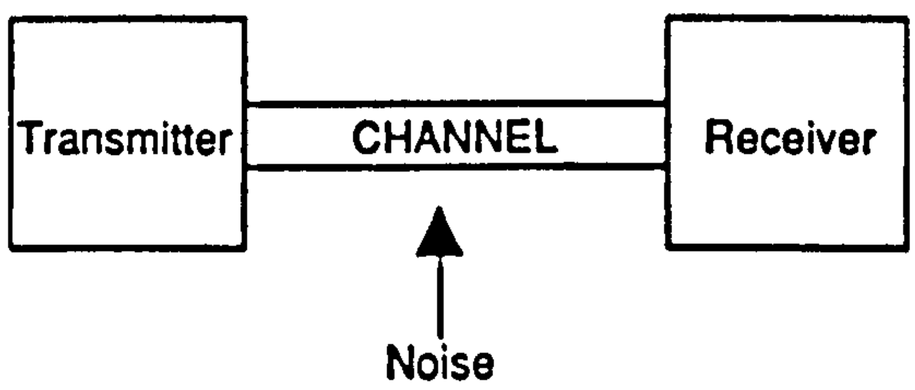
Laura-Ann Currie

Reading Passage B

# Information Theory

One of the first attempts to look at the structure of language was inspired by information theory, a theory originally proposed in the field of telecommunications by Shannon. The basic idea here is that *information* has nothing to do with the *content* of a message but is defined solely in terms of the amount of uncertainty that is reduced. If an outcome is already fully unpredictable, there is no uncertainty about it; therefore, the message sent conveys no information. But if there is some doubt or unpredictability about what the message will be, then when received it will convey some information.

Shannon proposed the following simple model of how information is transmitted from transmitter to receiver:




If the only possible message that can be sent by the transmitter is the letter A, then it is fully predictable and no information is transmitted by sending the message A. However, if there are two possible messages, A or B, then there is some uncertainty or unpredictability which is reduced if A is sent. The amount of uncertainty increases with the number of possible messages, and it is at its maximum level when the messages are randomly selected so that there is no way of predicting which will come next. This would be the case if a random series of numbers was being transmitted.

Shannon points out that this randomness, or maximum unpredictability, is far from being the case when one is dealing with human language. After each letter or word it is certainly not the case that the next message can be selected at random. After the letter *t*, for instance, there is only a limited number of letters that can follow and, after *q*, the letter *u* is in fact totally predictable in English. The same applies to what words can follow other words, e.g. there is a large but not unlimited number of words which can follow *The cat*.... The point Shannon is making is that human languages, far from conveying maximum information, are highly *redundant*. What redundant refers to in this context is simply the amount of predictability, detracting from complete uncertainty, in a message. In the examples above, *u* following *q* is completely redundant since there is no unpredictability about it; one cannot predict exactly what will come after *t* or *The cat*, but in each case it will be partially redundant since there is a limited number of possibilities. One method suggested by Shannon for trying to measure amounts of redundancy was to ask people to guess what would come next. In so far as they are able to guess correctly, the letter or word must be to some extent predictable and therefore redundant.

From: *Thinking and Language* by Judith Greene, 1975, p.91. The Essential Psychology Series, edited by Peter Herriot, published by Methuen & Co. Ltd (now Routledge), 11 New Fetter Lane, London EC4P 4EE, UK.

From *Learning to Read: Putting Parents in the Picture*,
published by The NFER-NELSON Publishing Company Ltd, Darville House,
2 Oxford Road East, Windsor, Berkshire SL4 1DF, UK.

Code 4290 01 6

# Activity 3: Question Types

Instructions

1. Read the passage provided and look at the questions being asked.

2. As a group, answer the questions.

3. Having answered the questions, look at each one and decide what type of question you have been asked. The aim is to provide labels for each of the questions.

Laura-Ann Currie

# Staring At The Sun[1]

This is what happened. On a calm, black night in June 1941 Sergeant-Pilot Thomas Prosser was poaching over Northern France. His Hurricane IIB was black in its camouflage paint. Inside the cockpit, red light from the instrument panel fell softly on Prosser's hands and face; he glowed like and avenger. He was flying with the hood back, looking towards the ground for the lights of an aerodrome, looking towards the sky for the hot colour of a bomber's exhaust. Prosser was waiting, in the last half- hour before dawn, for a Heinkel or a Dronier on its way back from some English city. The bomber would have skirted anti-aircraft guns, declined the publicity of searchlights, dodged barrage and night fighters; it would be steadying itself, the crew would be thinking of hot coffee fierce with chicory, the landing gear would crunch down - and then would come the poacher's crafty retribution.

There was no prey that night. At 3.46 Prosser set course for base, He crossed the French coast at 18,000 feet. Perhaps disappointment had made him delay his return longer than usual, for as he glanced up the Channel to the east he saw the sun begin to rise. The air was empty and serene as the orange sun extracted itself calmly and steadily from the sticky yellow bar of the horizon. Prosser followed its slow exposure. Out of trained instinct, his head jerked on his neck every three seconds, but it seems unlikely he would have spotted a German fighter had there been one. All he could take in was the sun rising from the sea: stately, inexorable, almost comic.

[1]Passage for Activity 3

# Questions[1]

1. Where was Sergeant Pilot Thomas Prosser poaching?

2. What was Prosser waiting for in the last half hour?

3. At what time did Prosser set course for base?

4. What would be the poacher's crafty retribution?

5. What was the disappointment which Prosser felt, making him delay his return?

6. Why did Prosser jerk his head every 3 seconds?

7. Which World War is the passage referring to?

8. What time of day was Prosser flying?

9. Was the Heinkel faster than the Hurricane IIB?

10. Why would the crew be thinking of hot coffee?

---

[1] Activity 3 and 4 Worksheet questions
Laura-Ann Currie

# Questions[2]

1. Where was Sergeant Pilot Thomas Prosser poaching?

(TE)

2. What was Prosser waiting for in the last half hour?

(TE)

3. At what time did Prosser set course for base? (TE)

4. What would be the poacher's crafty retribution? (TI)

5. What was the disappointment which Prosser felt, making him delay his return? (TI)

6. Why did Prosser jerk his head every 3 seconds? (TI)

7. Which World War is the passage referring to? (SI)

8. What time of day was Prosser flying? (SI)

9. Was 18,000ft an unusual height to be flying? (SI)

10. Why would the crew be thinking of hot coffee? (TI)

---

[2] Answers to Activity 3

# Activity 4: Question Strategies

## Instructions

1. Look at the questions from Activity 3.

2. As a group think about how you went about finding the information necessary to answer the question: First of all how did you go about trying to understand what the question was asking, and then how did you know where to look in the passage to find the right information?

3. List the strategies identified

**THINK:** Do you actively teach children the strategies you have identified?

Laura-Ann Currie

# Questions[1]

1. Where was Sergeant Pilot Thomas Prosser poaching?

2. What was Prosser waiting for in the last half hour?

3. At what time did Prosser set course for base?

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5. What was the disappointment which Prosser felt, making him delay his return?

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9. Was the Heinkel faster than the Hurricane IIB?

10. Why would the crew be thinking of hot coffee?

---

[1] Activity 3 and 4 Worksheet questions
Laura-Ann Currie

# Appendix 2b:

## Worksheet 1

# Questionnaire[1]

1. How do we help children to understand?

2. Why do we ask questions about a passage?

3. How do you know if you have understood something you are reading?

4. What does a child need to know to complete a cloze passage?

5. Why is a novel a useful method for teaching children comprehension skills?

[1] Worksheet for Activity 1

# Worksheet 1 with responses

# Questionnaire

1. **How do we help children to understand?**

Talking, explaining, questioning - further explanation

2. **Why do we ask children questions about a passage?**

To test understanding
knowledge of subject(s)

3. **How do you know if you have understood something you are reading?**

Makes sense
Thought provoking
Can remember it

4. **What does a child need to know to complete a cloze passage?**

Knowledge of meaning of what is written - understand passage as a whole.

5. **Why is a novel a useful method for teaching children comprehension skills?**

Because it is ongoing - not an isolated fact, passage.. Children can follow storyline & comprehension should be easier

# Questionnaire

**1. How do we help children to understand?**

Discussion
Questions - Focusing on different aspects of information. Different types of questions
Explanation of unfamiliar words & concepts

**2. Why do we ask children questions about a passage?**

① To focus on particular points in passage to help their understanding
② To check if they have understood passage or do they require further clarification on points.

**3. How do you know if you have understood something you are reading?**

If I can explain or go through myself what it is about

**4. What does a child need to know to complete a cloze passage?**

What passage is about.
Able to help guess from words around blank
From context.
Discussion on variety of possible words

**5. Why is a novel a useful method for teaching children comprehension skills?**

Stimulus
Environmental Aspect adds to stimulus
Interest of child.

# Questionnaire

1. **How do we help children to understand?**

Talk about content:- Show other examples

2. **Why do we ask children questions about a passage?**

To find what they know & understand about it.
To hear their opinions.
To assess their level of Comprehension.

3. **How do you know if you have understood something you are reading?**

I can tell you about it.
Use the information read.

4. **What does a child need to know to complete a cloze passage?**

How to pick up clues from it.
When to use a noun, verb etc.

5. **Why is a novel a useful method for teaching children comprehension skills?**

On-going story theme - more opportunity for applying their skills & extending them.
Interest level.

# Questionnaire

**1. How do we help children to understand?**

Discussion
Question
Read with "meaning"

**2. Why do we ask children questions about a passage?**

1) To lead children to deeper understanding
2) To assess comprehension
3)

**3. How do you know if you have understood something you are reading?**

1. Do questions arise when passage has been read
2. If subsequent passage do not "fit" with previous passage.
3.

**4. What does a child need to know to complete a cloze passage?**

Basic understanding of original passage

**5. Why is a novel a useful method for teaching children comprehension skills?**

1. Variety of novels - can be selected for particular interest of children
2. Sequence - one chapter leading to next - "plot outline".
3

# Appendix 2c:

## Handout 1

# The Thinking Reader: - a metacognitive approach to reading comprehension.

**To accompany:** Mr. Homunculus the Reading Detective

# The Thinking Reader - a meta-cognitive approach to reading comprehen-sion.

[redacted]

**"What is most important (*in relation to developing children's comprehension*), is for educators to realise that action must be taken to help children acquire effective metacognitive strategies" *(Kendal and Mason 1982).***

Research into reading increasingly has focused on the concept of metacognition and its application to the development of children's reading comprehension. This is alluded to within the SOED document "English Language 5-14- Curriculum and Assessment in Scotland- A policy for the 90's" by statements such as *"the importance of **meaning** should be stressed at all times"* p41 par 3 and *"in longer reading activities for example novels, teaching the **strategies** which help them to make sense of aspects such as plot, characters and themes is essential"* p41 par 10.

## What is meta-cognition and how does it relate to teaching practice?

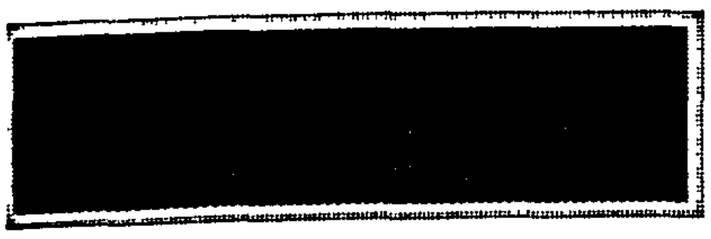
Metacognition is about thinking. It is concerned with the child's knowledge and regulation of his/her own internal processes whilst thinking. In relation to reading comprehension it is the knowledge a child has about the reading process, the insight about his/her failures to understand and the subsequent ability to implement appropriate remedial or support strategies. When a child or adult is reading they should be monitoring what they are reading and making on-going self assessments about whether or not they are continuing to understand. If it is recognised by the individual that they are failing to keep track of what is happening, they should take appropriate remedial strategies to address the situation. They may re-read a passage or sentence, go on to the end of the sentence or seek clarification from a picture or diagram. Competent readers do much of what is described above unconsciously and it is only when a problem arises that they are suddenly made aware of their internal thinking processes.



Laura-Ann Currie

An example of this is sometimes experienced by adults when reading a newspaper and discovering a misprint. The reason they discover the misprint is that, as they read on, they realise that the sentence no longer makes sense. To be aware of this they must have been monitoring their understanding whilst reading.

Children need to be taught the skills outlined above. They need to be given strategies to become self-regulated readers so as to become better comprehenders of print.



**"reading for meaning involves .... keeping track of the success with which one's comprehension is proceeding, ensuring that the process continues smoothly, and taking action if necessary" *(Brown 1980)***

## What Do Children Need To Be Taught?

Children need to be given knowledge:

i) about the task (eg **what** is the purpose of a cloze passage, what are the task demands of a cloze passage?)

ii) about **how** to approach the task (eg to find the most appropriate word in a cloze passage it is helpful to read the whole sentence missing out the word to be filled in, to think about the kind of word which it might be: ie is it a verb, adjective, etc)

iii) about **when** and **why** to apply a specific strategy.

Presently children may be taught the 'what' and 'how' aspects of reading (i) and ii). To introduce the 'when' and 'why' it is necessary to encourage the child's self-regulatory skills and this is rarely taught explicitly. All three components need to be taught to children if they are to become thoughtful, strategic and independent comprehenders.

## Teaching Strategies

The teaching of metacognitive skills for reading comprehension relies heavily on the skills of the teacher. It can not be taught using a series of exercises from workbooks because it is dependent on the teacher interacting with the learner, sharing problem solving experiences and skills and discussing strategies. In teaching metacognitive skills to children the teacher adds the third dimension to reading comprehension thereby changing a potentially two dimensional activity into a three dimensional one.

Laura-Ann Currie

There are many strategies used to help children develop into self-regulatory and strategic readers. Most focus on providing children with "comprehension attack" skills, before, during and after reading. **Before** strategies relate to preparation activities such as drawing the child's attention to the title and picture, encouraging them to make predictions about the text on the basis of these initial clues and drawing their attention to how their own previous knowledge and experience may further help them understand the passage. **During** strategies encourage the child to monitor their understanding as they are reading, perhaps to ask themselves questions about the text as a form of self-assessment and reading on and back through the text if failures to understand occur. Strategies applied at the **end** of reading a passage take the form of a summative assessment, the child tries to re-cap on what has happened, identify main ideas and possibly words or phrases which they have found difficult to understand and therefore requiring further thinking.

All of these examples depend on **explicit** instruction from the teacher and emphasise to the children **what**, **how**, **when** and **why** to use such strategies. The skills can be taught using a number of different methods, however all depend initially on the interaction of the children with one another and their teacher. Two common methods used to introduce and make children aware of the above reading comprehension strategies are modelling and direct explanation.

## Modelling

Modelling depends on the teacher providing the children with examples of how a strategic reader would approach a comprehension activity. She/he demonstrates the thinking processes involved whilst reading by talking the children through her/his own experience whilst reading. This can be reinforced by allowing the children to role play the teacher's example, either by turn-taking with the teacher or a peer.

### Example:

The teacher may want to highlight for the children that there are different levels of interpretation one can make whilst reading a passage. First of all she would clearly state this fact thereby providing the children with knowledge about the nature of the task (the 'what' aspect). She would then want to provide the children with examples of the different kinds of questions one can ask about a passage (broadly: literal and inferential). Again she is describing the task and providing 'what' type knowledge. Having achieved this goal she would then

want to suggest to the children that to assess ones understanding at the different levels of interpretation it is helpful whilst reading to ask oneself a question and to see if it can be answered. She might suggest that it is easier to start with literal questions and then to move onto more difficult inferential questions. Instruction and practice would be given at this stage as to how to formulate the different types of questions.

Finally the teacher may want to indicate to the children that asking questions is a helpful strategy to use for monitoring ones understanding and in preparation for answering questions which may be posed at the end of the reading assignment. At this stage she is providing the children with 'when' and 'why' types of knowledge.

In moving through the above process, the teacher will have taken time to model for the children the asking of questions, and the ways of going about finding information in the text to answer them. She will also have provided the children with opportunities for practising the teacher's examples with each other, ending perhaps with an independent written comprehension exercise where the children are encouraged to use the strategies taught by oral example.

## Direct Explanation

Direct explanation is very similar to the example given above except that it is not presented by the teacher through modelling. The teacher will provide the children with the same what,how, when and why information, but this will be given directly through hand-outs, group discussions and short exercises geared at practising a specific skill such as formulating literal questions about a passage.

In practice modelling and direct explanation work hand in hand and this is demonstrated in the modelling example where direct explanation is used at certain points in the instruction.

## Summary

If children are to become good comprehenders of text then they need to be taught explicitly what, how, when and why to apply reading comprehension strategies. They need to become self-regulatory readers, monitoring their own thinking processes whilst reading. In achieving this goal they will have become Thinking Readers.

# Information Sheet 1: Question Types

There has been a lot of research in the area of comprehension and the different kinds of question and answer forms which can be devised. Much of this research has been instrumental in the development of more recent reading tests and in the preparation of teaching material. Some of the information obtained from this research is complex and involved, identifying up to six different types of categories of question forms. A useful taxonomy in terms of its applicability to class-room teaching is that provided by Pearson and Johnson.

Pearson and Johnson identified three basic question/answer categories:

1) Textually explicit

2) Textually implicit

3) Scriptally implicit

Question category 1 requires a literal level of interpretation and is the most basic form of question with limited analysis or understanding of the text being required. Frequently the answer can be lifted straight from the text using most of the question form in the answer.

**For example:** Question: What was the name of the child in the story?

Answer: The name of the child in the story was .....

Textually explicit questions usually begin with 'what", sometimes "when" and "how", and less frequently "who".

Question categories 2 and 3 are inferential. These are the questions which require higher order reading skills. They make greater demands on the readers' comprehension skills requiring the reader to interpret, make judgments and evaluations. Textually implicit questions require the reader to synthesise information from various parts of the text in order to determine the answer. Scriptally implicit questions require the reader to use the information implied from the text but also to use their own experience and previously acquired knowledge. Scriptally implicit questions can not be answered solely from the information provided in the text.

**For Example:** If the story tells the reader that the events described occurred in 1941 and then asked the reader: "In which World War did the events in the story take place?"
The question being asked could only be answered if the reader knew that World War II occurred in 1941.

Textually and scriptally implicit questions usually begin with "why".

# Teacher Information Sheet 2: Strategies for Developing Children's Question Answering Skills.*1

## Stage one: Describing the task demands

It has been shown that the most effective way of enhancing children's question answering skills is to begin by providing them with information similar to that described in Information Sheet 1. By doing this we are alerting the child to the facts that there are different types of questions and that each requires a different level of analysis. It is therefore important to discuss with the children the three different question types (textually explicit, textually and scriptally implicit), and to explain that each will involve them in obtaining different information.

In relation to the theory on metacognition what is being described are the task demands ie the "what" aspect.

## Stage Two: Providing skills for answering questions

Once the children are aware that there are different types of questions they need to be taught how to identify the different question types. This is the first stage in beginning to learn how to answer questions. If the children can ascertain that a question is likely to be an explicit one, then they will know that the answer they are looking for should be clearly and obviously stated in the text . Such information should be explicitly stated to the child, first through oral discussion with the teacher providing a model of good practice, and then in written form.

## Stage 3: Explaining When and Why to apply the strategy

It is important that when the children are being taught how to apply the above strategy, that they are also told why they are being taught to identify question categories and to realise that they can apply this technique in any situation where a question is be asked. The why and when aspects of an instructional programme can be delivered at various stages in the teaching programme. For this reason it is important the Stages 1 to 3 are not necessarily viewed as sequential, but as interrelated and therefore dependent on one another for success.

By using the structure outlined above the teacher is providing the child with metacognitive knowledge at the declarative (knowing what ), procedural (knowing how) and conditional (knowing why and when) levels!

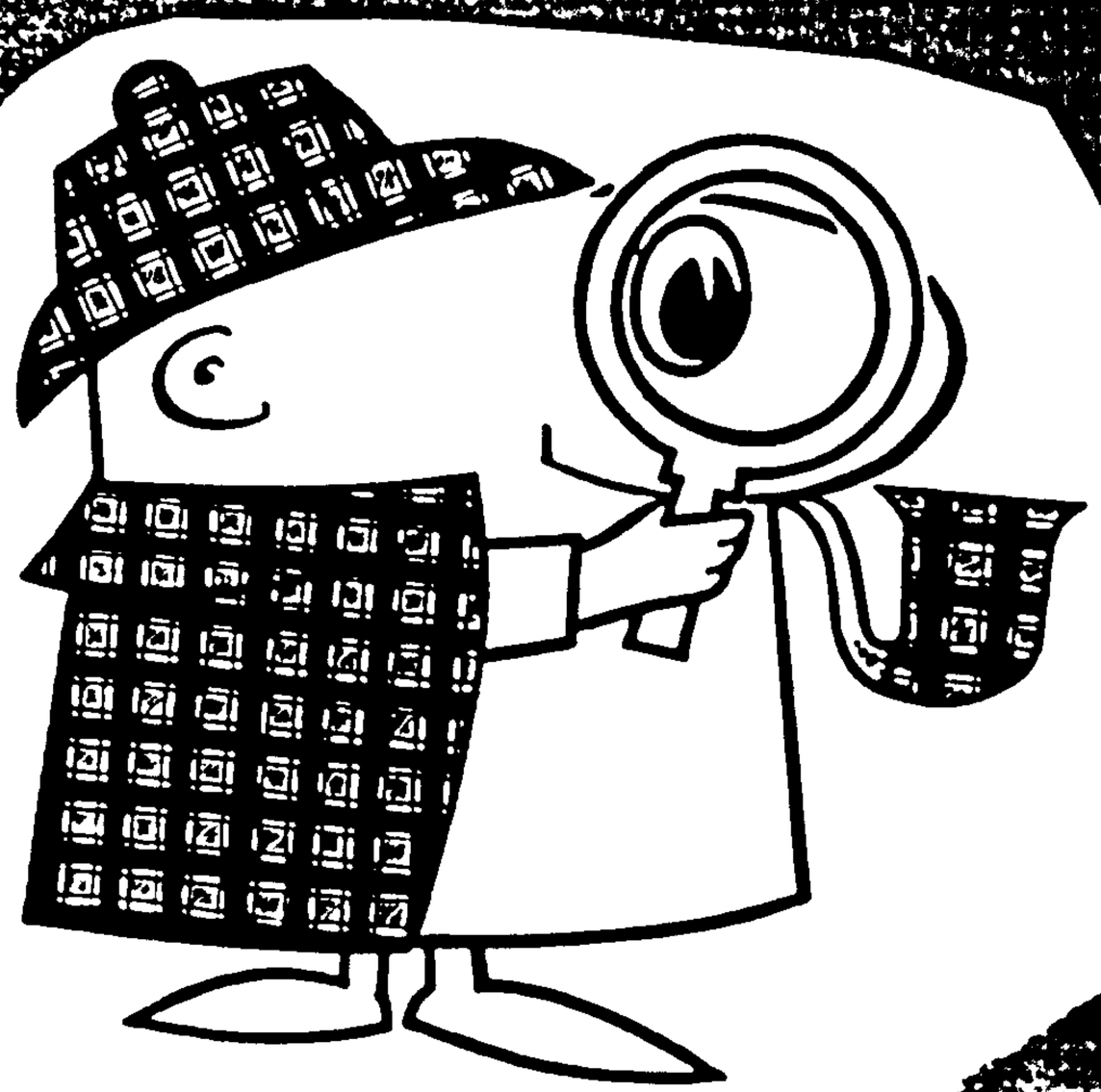
---

1 This section accompanies Information sheet 1.

# Appendix 3

# Metacomprehension Teaching Programme: Teacher's Handbook and Materials, and Children's Pack

# MR HOMUNCULUS - THE READING DETECTIVE: A Metacognitive approach to developing reading comprehension



Teacher's Handbook

# Introducing Mr. Homunculus the Reading Detective

It is helpful for children to have something concrete on which to attach new information. The use of the novel study will ensure that the children have common background information and motivation and interest. Mr. Homunculus builds on the benefits of the novel by providing a character for the children to relate to and possibly a model to emulate, and remind them to use their new skills. The use of the name "Homunculus" is an adult joke, meaning "little man". For the children it is the little man in the head who asks them questions whilst reading and helps them to keep monitoring their understanding of the text. Children enjoy big words, particularly those with a good sound to them (think of children's nursery rhymes such as "on the ning, nang, nong" or the story about Rumplestiltskin etc). It is hoped that Mr. Homunculus will appeal to their sense of humour.

The reading detective is a useful metaphor for developing specific reading strategies such as searching for main ideas, looking closely at questions to determine their type, and reading backwards and forwards in a text to find psycholinguistic clues.

Mr Homunculus the Reading Detective provides the educator with a vehicle for achieving the two aims noted above. Mr. Homunculus is the wee man in the head helping the children achieve goal one, and as a Reading Detective he reinforces the strategic reading skills being taught in goal number two.

# Teaching Notes

## Introduction

The teaching programme has two aims:

***1) to encourage children to be aware of their thinking processes whilst reading, thereby encouraging them to be self-regulatory readers***

***2) to provide children with strategies for attacking reading comprehension problems***

**Reminder:**

It is important to provide children with explicit instructions about:

i) what the comprehension task is

ii) how to approach the task

iii) when the specific strategies should be used

iv) why the specific strategies you are teaching will help aid their comprehension

**This is the what, how, when, and why rule.**

# Information Sheet 1: Question Types

There has been a lot of research in the area of comprehension and the different kinds of question and answer forms which can be devised. Much of this research has been instrumental in the development of more recent reading tests and in the preparation of teaching material. Some of the information obtained from this research is complex and involved, identifying up to six different types of categories of question forms. A useful taxonomy in terms of its applicability to class-room teaching is that provided by Pearson and Johnson.

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Textually and scriptally implicit questions usually begin with "why".

# Teacher Information Sheet 2: Strategies for Developing Children's Question Answering Skills.*1

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It has been shown that the most effective way of enhancing children's question answering skills is to begin by providing them with information similar to that described in Information Sheet 1. By doing this we are alerting the child to the facts that there are different types of questions and that each requires a different level of analysis. It is therefore important to discuss with the children the three different question types (textually explicit, textually and scriptally implicit), and to explain that each will involve them in obtaining different information.

In relation to the theory on metacognition what is being described are the task demands ie the "what" aspect.

## Stage Two: Providing skills for answering questions

Once the children are aware that there are different types of questions they need to be taught how to identify the different question types. This is the first stage in beginning to learn how to answer questions. If the children can ascertain that a question is likely to be an explicit one, then they will know that the answer they are looking for should be clearly and obviously stated in the text . Such information should be explicitly stated to the child, first through oral discussion with the teacher providing a model of good practice, and then in written form.

## Stage 3: Explaining When and Why to apply the strategy

It is important that when the children are being taught how to apply the above strategy, that they are also told why they are being taught to identify question categories and to realise that they can apply this technique in any situation where a question is be asked. The why and when aspects of an instructional programme can be delivered at various stages in the teaching programme. For this reason it is important the Stages 1 to 3 are not necessarily viewed as sequential, but as interrelated and therefore dependent on one another for success.

By using the structure outlined above the teacher is providing the child with metacognitive knowledge at the declarative (knowing what ), procedural (knowing how) and conditional (knowing why and when) levels!

---

1 This section accompanies Information sheet 1.

# Part One: Developing Self - Regulatory Skills: Introducing Mr. Homunculus

## Lesson One: Monitoring one's own understanding

The series of activities in this section are designed to develop children's awareness of their own thinking whilst reading. The idea of having a wee man in their head who talks to them about how they are getting on whilst reading is introduced in the form of Mr. Homunculus. He will remind them to think about whether or not they have understood what they have read, and will encourage them to stop periodically in their reading and to assess their own comprehension. The first two activities are simply designed to encourage the children to keep track of their understanding. The subsequent activities are designed to introduce them to specific strategies which can be used before, during; and after reading to measure their understanding. Such strategies are dependent on using Mr. Homunculus as the Reading Detective.

# Exercise One

*Aim: to make children aware that it is important to ask themselves the question :"do I understand what I am reading?"*

**Instructions:**

*1.* Introduce Mr. Homunculus to the children as the little voice in their heads who reads with them and asks them: "do I understand this?"

*2.* Take **Passage A** from the novel and read it to the children. As you are reading stop periodically and ask out loud: "Do I understand?". In this way you will be modelling for the children the importance of monitoring understanding. It is not intended at this stage that the children will be adept at formulating questions about the text or applying remedial comprehension strategies if they discover that they do not understand. These skills will be taught later on. It is sufficient for the children to realise that they must stop and start whilst reading in order to be able to monitor what they read. The aim is simply to make them aware of the necessity of asking themselves the question: "do I understand this?", thereby making them think about their thinking whilst reading.

*3.* Having been given an explanation and a model of stopping and starting whilst reading, allow the children to take turns pretending to be the teacher and practising self-monitoring. Give the target child time to read a small section silently to themselves before modelling self-monitoring to the other children. (There are markers in the teacher's passage suggesting where to stop and

ask the question: 'Do I understand'?, together with where to introduce the children)

***4.*** Having finished Passage A, provide the children with reading Exercise 1. The markers in the text are designed to ensure that during silent reading the children continue to apply self monitoring strategies by stopping and starting and thinking about their own understanding.

***5.*** When the children have finished the exercise, gather them together as a group and ask them to summarise each section where they were asked to **STOP** and ask themselves the question: 'Do I understand'?

**Organisational Note**

***1.*** The discussion groups can be done as a whole class or within the children's reading groups. It is probably easier to manage within a small group setting but would mean a certain amount of repetition for the class-teacher.

# Exercise 2

*Aim: to highlight to children the importance that word order and meanings have on one's understanding of print.*

## Instructions

***1.*** Remind the children of Mr. Homunculus and repeat the reading example described in point 2. of Exercise 1, using **Passage B.**

***2.*** Explain to the children that sometimes when we are reading, Mr. Homunculus tells us that there is something not quite right about what we are reading - something which doesn't make sense. When this happens Mr. Homunculus is telling us to **STOP** reading because we don't understand - we have lost track of the story.

***3.*** Take **Passage C** and give a copy to each of the children. Now read it to the children. The Passage has a number of deliberate errors. Some of the errors are nonsense words, some are word order (syntactical), and/or semantic errors. When you detect an error, stop and point this out to the children in the form "this doesn't make sense". Read on through the passage highlighting for the children when the story begins to lose its meaning. When you reach page 2 of the story, encourage the children to shout out "Mr. Homunculus says....." when the story doesn't make sense. At this stage ask the children why it doesn't make sense. You can give them clues to point them in the right direction. When you have stopped and discussed a nonsense, word order or semantic error, tell the children that understanding what words mean and paying attention to the way words are organised in a sentence, all make a difference to our ability to understand.

*4.* Give the children **Exercise 2** to practice the above skills whilst reading silently. They are required to make a mark on the page when the story doesn't make sense.

*5.* Gather the children together again and read over the exercise as a group. Ask the children to make sense of the passage by correcting the errors. By doing this you will be helping the children to think about word order and meaning - the main components of cloze procedure.

# Part Two: Developing Comprehension Strategies: Introducing Mr. Homunculus the Reading Detective.

## Lesson Two: Reading Strategies to use in conjunction with self-monitoring

From the exercises in Lesson One it is hoped that the children will have begun to monitor their reading behaviour and to be aware of Mr. Homunculus, the voice in their head. As a result of these exercises some of the children may have begun to use reflective reading strategies to determine whether or not they have understood what they have been reading. Other children will simply be making a wild guess, partly determined by their feelings. Broad statements may be made, such as, "this is hard" or "I can't read this" (meaning they don't understand). It is important to teach children specific reading strategies which will help understanding. Those children who are applying some of the skills unconsciously will be made aware of how, when and why to use the skills in other reading situations. Those children who are responding in terms of feeling and are unaware of why they find the reading task difficult will learn how to gain meaning from the story and make it "easier" to read.

If a competent reader is asked if they understand a text, they will normally begin to read on and backwards over the text, and to focus on parts which they have found particularly difficult, reading such parts more slowly, and spending more time re-reading. These are metacognitive reading strategies instigated as a result of continuing self-monitoring of reading comprehension. The following exercises aim to teach children to use these skills during their reading.

# Exercise 3

***Aim:*** *to teach children to read on and backwards in a text and to re-read parts of text which they have identified as particularly difficult.*

## Instructions

***1.*** Remind the children of Mr. Homunculus who talks to them as they are reading, asking them to think about whether they are following the story. Hand out reading **Passage D** and ask the children to read it silently with you (you will be reading it out aloud). Stop now and again to ask the question: "do I understand this"? When you have asked the question two or three times, stop, and ask the children what they do when they hear Mr. Homunculus talking to them (this is to ascertain whether the children volunteer reading strategies such as re-reading etc.). Accept all answers and don't be surprised if the children are unable to identify specific strategies (this is what you are going to teach them). Begin reading with them again. The next time you stop to ask: "do I understand this"?, talk the children through the strategies you use to see if you have understood.

## The strategies

Tell the children that you:

I. re-read the first few sentences or section (paragraph) again.
II. read onto the end of the sentence or the next section to see if it gives any more information
III. re-read the same section slowly, stopping at the commas and asking the question "what did that little bit tell me"? (summarising)

Explain that you might use all of these detective skills several

times until you are sure that you have followed the story.

***2.*** Now continue reading the story and when you stop tell the children that you are re-reading the first section again, and get them to do this, silently, with you. Use all three strategies with the children.

***3.*** Read on and ask one of the children to copy what you have done (ie pretend to be the teacher) and get the rest of the children to follow the example. Repeat using a different child if you feel this is necessary.

***4.*** Give the children **Exercise 3** to work on by themselves.

Before they start explain to the children that Mr. Homunculus will help them by providing little reminders in the story. Show the children the poster with Mr. Homunculus' detective signs and go over what they mean.

***5.*** When the children have finished the silent reading exercise, ask them to draw Mr. Homunculus' signs from memory.

***6.*** Bring the children back as a group and ask them when they think they should use Mr. Homunculus' detective skills. You should be encouraging them to see the relevance for all reading activities and particularly when they find a piece of writing hard (eg: the same strategies can be used when they are given a difficult question to answer about the story).

# Exercise 4

***Aim as in Exercise 3:*** *to teach children to read on and backwards in a text and to re-read parts of text which they have identified as particularly difficult.*

This exercise repeats the skills taught in Exercise 3, but this time the children are not provided with Mr. Homunculus' clues in the text. They have to decide for themselves when to stop and which of the strategies they are going to use to improve their understanding. The exercise shouldn't need a lengthy introduction. Before handing out the exercise sheet it is probably a good idea to get the children to remind each other what Mr. Homunculus' detective skills were, and possibly to role play the thinking strategies used.

NOTE: You may want to ask the children to mark on the passage which, if any, of Mr. Homunculus' detective skills they used.

# Lessons Three : Strategies to assess one's understanding of print

Lesson One concentrated on making children aware that it is relevant and helpful to think about whether or not they understand what they are reading as they decode. Lesson Two encouraged them to act on their evaluation of their self-monitoring, thereby becoming more thoughtful readers. The next step is to provide children with more sophisticated strategies to test out their level of understanding. This requires giving information and helping them to acquire knowledge about the different levels of analysis with which a reader is involved, when trying to gain meaning from print. The teachers notes related to question types is a helpful reference for this section (information sheets 1 and 2).

## Exercise 5: Formulating questions to test understanding

*Aim: to teach children to stop periodically whilst reading and to ask themselves a question about the story.*

**Instructions**

*1.* Use reading **Passage E** and give a copy of the passage to each child.

*2.* Remind the children about Mr Homunculus. Introduce them to the idea that not only does he talk to them when they are reading, but he can also help them to check out whether or not they have understood the story, by being a reading detective. Tell them that

a reading detective finds clues that can help them to understand a story..

***3.*** Having introduced Mr. Homunculus the reading detective, suggest to the children that they might also like to learn how to be a reading detective. Explain that you are going to teach them reading detective skills which Mr. Homunculus uses when he is reading to give him clues about what the story is about.

***4.*** **Providing information (direct explanation).**

Explain to the children that there are six basic types of question which begin with: **what, why, where, who, when,** and **how.** They can use these to check their understanding of a story by stopping reading every now and again, and then trying to make up a question to answer, using each of the question types. Tell them that they are going to practice this strategy.

***5.*** Read a small part of the passage and model for them the formulation of a "what" type question (this is provided in the teachers pack). Answer the question for the children drawing their attention to where the information is in the text. Now ask them to think of a "what" question and chose one child to give you their example. Ask the child if he/she knows the answer by getting him/her to respond "yes" or "no". Tell the child not to shout out his/her answer. Instead ask the other children to see if they can find the answer in the story. Do this with the other five question types.

***6.*** Now read on in the passage and stop at the point indicated. Ask the children what they should have been doing as they were reading silently along with you (ie asking themselves if they understood what they were reading, glancing back and forwards

in the story etc.).

*7.* Send the children back to their groups and get them to think of questions and answers in their peer groups. If you are satisfied that they can cope with this activity, move onto step 8. If you are not sure that they have mastered the strategy, then gather the children around you again and give them further models of how to do the task.

*8.* Hand out **Exercise 5** which is a continuation of the story you have been reading together. The passage has markers aimed at reminding the children to form a question for themselves to answer.

*9.* Once the children have finished **Exercise 5** bring them together again as a group and ask them to give you one or two examples of the questions they asked of themselves. See if the other children can find the answers

*10.* End the lesson by asking the children **when** they would use Mr. Homunculus' reading detective skills. You would want to establish:

I. that it is a good skill to use whenever they are asked to read
II. that it will help them to better understand what they are reading, and
III. it will help them to answer questions which other's might ask of them.

# Lesson Four: Teaching children question/answer strategies

Note: Before proceeding with this section please refer to teacher Information Sheets 1 and 2.

Lesson three encouraged the children to ask a wide range of questions starting with the six most commonly used question forms (what, why, where, when, who and how). They will have realised that some question forms are harder to use than others. Thus the "why" and "how" types of questions may have presented them with greater difficulties than, for example, the "who", "what" and "where" forms. In parallel with this they will have begun to realise that there is a connection between the ease, or not, of formulating a question, and the difficulty experienced in finding the answer. Thus "difficult" self-formulated questions tend to produce difficulties in finding answers. As adults we are aware that this is because questions and answers are directly related, and what makes a question, and therefore the answer, difficult, is the amount of interpretation which the reader is required to make of the text. Textually explicit questions are therefore easier to answer than textually, or scriptally implicit questions because the answers can be lifted straight from the text and do not require very much integration of information, or the use of previous background knowledge. Usually "why" and "how" questions fall into the category of textually or scriptally implicit and are therefore more difficult to answer. The exercises covered in Lesson Four address the above points. The aims are:

***Aim 1:*** *to teach children the relationship between questions and answers*

***Aim 2:*** *to teach children how to formulate literal and inferential questions, to be able to identify these categories, and to know when and why to use the skill*

***Aim 3:*** *to teach children to relate the question category to the likely amount of interpretation which will be required to find an appropriate answer.*

Each exercise will identify the aims being covered as there will be some overlap. As this section covers a number of important metacognitive skills in relation to reading comprehension, it is expected that a number of sessions will be spent reinforcing and establishing the above aims.

# Exercise Six

***Aim:*** *to teach children the relationship between questions and answers*

**Instructions**

**Note:** This is an oral exercise and examples of questions can be found in the teachers pack if required.

***1.*** Remind the children about the exercises covered in Lesson three, where they were encouraged to stop and ask themselves a where, what, who, when, why and how question. Remind them that this was Mr. Homunculus the reading detective finding clues and reminding them to think about whether or not they were following the story.

***2.*** Hand out **Passage F** Tell the children that you are going to read the story and when you stop they are to.....(get them to offer the answer, which is: to ask a why, what, where, when, who, how question). When they have done this ask the children if some of the questions were harder to formulate than others, and if so, which ones. Now see if they can think about why some questions were harder than others. Prompt the children by getting them to think about how easy or difficult it was to find an answer to their question. You may need to go back and give the children an example of you asking a question and talking out loud about how you would go about finding the answer. (By doing this you are giving the children access to your thinking processes, which they can try to emulate).

The aim of the discussion is to establish that those questions which produced easily accessible answers were the easiest to think about. Questions which did not produce easily accessible

answers and needed more detective work are usually harder to think of.
It is important that at the end of the discussion the children realise that question and answers are related, and that some question/answer forms are easier than others.

# Exercise 7

***Aim:*** *to teach children to identify different question types*

## Introduction

Information sheet 1 described three types of question. These were textually explicit, and textually and scriptally implicit (for details refer to Information sheets 1 and 2). The objectives of the next exercises are to:

I. provide children with knowledge of the different question types
II. enable children to identify the different question types
III. enhance children's ability to answer questions using the skills and knowledge obtained in i) and ii) above

In achieving these objectives you will have provided children with declarative (knowing about the task), procedural (knowing how to apply the skills) and conditional (knowing when and why) knowledge: the three components of metacognition.

## Instructions

***1.*** Tell the children that there are three different categories of questions which they might be asked, or which they might want to ask of themselves (relates to Exercise 5). Explain that you are going to give them information of, and practice in identifying, the different categories of questions.

***2.*** Introduce the three categories of questions in the following way:

i) tell them what the three different question categories are using the following terms:

**A. The Given Questions**: These are questions which provide answers easily found in the story. You can use most of the words in the question for your answer.

ii) Write the following example on the blackboard, or provide the children with a written example: Q: What **was the name of the girl in the story**? A: **The name of the girl in the story was** Claire. Highlight the similarity of the words used in the question and answer.

iii) Hand out **Passage G** and read up to the first STOP marker. Ask the children question 1 (found in the teacher's pack) Talk the children through the thinking processes which you would use when trying to find the answer. Do the same for question 2. **Both of these questions are examples of the textually explicit, or Given category.**

**B) Thinking Questions:** Explain that some questions need a lot of thinking about because the answer is not always clear. Tell the children that in finding answers to **Thinking** questions they need to be like Mr. Homunculus, the Reading Detective, and find clues in the story. Explain that the clues might be in more than one place in the story, so they need to be careful to read back and forwards in the passage. A little bit of guess work is needed because they need to put the clues together and find a good solution.

ii) Read on in the passage until you reach the next **STOP** marker. Ask the children question 3. Tell them that they are to look for the clues in the story and not to shout out the answer

iii) Talk the the children through the process you would go through to find the answer (Show them the clues). Now ask them to try question 4. Ask a child to tell the other children what clues they were looking for when they tried to answer the question.

**C) Me Questions:** Introduce the children to the idea that some questions need the reader to bring some of their own experiences and information about other stories to enable an answer to be found. They need to use the information in the story and relate this to what they already know, or have done. Mr. Homunculus would use the clues in the story and his experience of other detective exercises. Explain that they must do the same and use there knowledge about other stories, or experiences which they have had at home and school to answer the question.

ii) Use questions 5 and 6 as examples.

***3.*** Give out copies of **Passage H** and read it together. Remind them that when you are reading together they should remember Mr. Homunculus, the voice in their heads, asking if they understand.

ii) Hand out the questions for Passage H. Look at the questions together and as a group, get the children to try and guess what type of question they are being asked. Discuss their answers, providing feedback about whether or not they are most likely to be correct and why.

iii) Get the children to mark the questions on their own.

# Exercise 8

***Aim:*** *To provide further practice in identifying question types*

**Instructions**

***1.*** This exercise is the same as Exercise 7 but there is no need to provide the in depth introduction to the exercise. It should be sufficient to remind the children of the different question types, perhaps to talk through one or two examples together, and then to set them **Exercise 8** which should be completed individually. The task asks the children to identify the question category (Given, Thinking, and Me forms). They are not required to write their answer. In trying to identify the type of question they will obviously need to think about the answer. The answers to the questions can be discussed when the children reassemble as a group to look at their answers.

***2.*** When the children have completed the exercise, gather them back together again and go over the task, talking through how you would go about trying to identify the question category. You should explain that in identifying the question category, you also have to think about the possible answer.

# Exercise 9

***Aim:*** *to identify question type and provide appropriate answers*

## Introduction

Exercise 9 is the same as exercises 7 and 8, but this time the children are required to write down their answers. The amount of preparation required will be dependent on how well you feel the children have coped with the previous exercises.

## Instructions

***1.*** Go over the question categories and remind the children about how to find information in a story (remember Mr Homunculus).

***2.*** Hand out **Exercise 9** and ask the children to first of all think about what category of question they might be being asked. Tell them to indicate this beside each question. They should do this before answering each question, one at a time.

***3.*** When the children have completed the exercise, go over it with them.

# Exercise 10

***Aim:*** *to encourage the children to formulate their own questions using the three question categories*

## Introduction

One of the strategies used for developing self-monitoring skills was to get the children to formulate their own questions whilst reading. You will remember from Exercise 5 that this was achieved by teaching the children to ask a question beginning with why, where, what, when, who and how. A further refinement of this is to use the question categories identified in the previous exercises. The following exercise aims to provide the children with practice in this skill.

## Instructions

***1.*** Give the children **Passage I** and read it together up to the marked section. When you have finished reading, ask the children what they were thinking about when they read. The aim is to elicit the self-monitoring skills taught in the previous exercises. You may have to provide prompts to get the information you need.

***2.*** Continue reading the passage, this time instructing the children to use the strategies they have just been discussing. Stop when you get to the next marker.

***3.*** Now introduce to the children the idea that they may want to ask a question similar to those used in Exercises 8 and 9. Remind them that there are three different types of questions and go over them again. Explain that by doing this they can be one step ahead of the teacher, possibly inventing a question which they may be

asked at the end of the exercise.

***4.*** Finish reading the passage together. Tell the children that you are going to play a game. They have to think of a specified question category (ie you tell them to think of a **Thinking** question) whilst you are reading together. Explain that you will be doing this as well, and you will write it down. At the end of the passage you will ask some of them to say what they had thought of, and the aim of the game is to see if they have the same or a similar question to you. This will be judged by the similarity of the answer, so they must also have an answer to the question which they have asked. Invent several questions using the different question categories.

**Note:** You may want to do this, or continue the exercise as a group game. To do it this way you would have to tell the children that they should take turns being the teacher. The 'teacher' decides on the question category and the others in the group have to make up a question to fit the chosen category. If one of the children formulates a question the same or similar to the 'teacher', then he/she swaps, and becomes the new 'teacher'. If nobody gets near to the 'teacher's' question category after three shots, then they must chose someone to take over as the new 'teacher'.

# Lesson 5 : Consolidating and generalising thinking skills

The exercises in Lessons 1 to 4 introduced the children to the importance of thinking about their thinking whilst reading. To listen to the voice in their heads which tells them that they are failing to understand - that a passage is becoming difficult and losing its meaning. These are the skills of a competent, thinking reader. They will also have acquired some reading strategies for helping them to regain the meaning of the story, thereby acting on the information obtained from their self-monitoring of their ongoing reading behaviour. It is important to ensure that such skills and knowledge are not restricted to one part of the curriculum (eg language lessons). The children must be taught that the thinking skills they have learned can be used in any part of the curriculum where reading is involved. The following two exercises aim to consolidate their learning and to help promote generalisation across the curriculum.

# Exercise 11

***Aim:*** *to consolidate learning*

**Instructions**

***1.*** Hand out **Passage J** and begin to read it together. Stop at the marker and ask the children to continue reading silently to themselves.

***2.*** Send the children back to their reading groups and ask them as a group to tell each other what they were doing when they were reading silently. They should be given 5 to 10 minutes to do this and then asked to come together again with you.

***3.*** Ask the reassembled group to tell you what they had discussed. You should be aiming to get the children to volunteer information about the self-regulatory behaviours which they should have been applying (asking themselves the question "Do I understand?", making up a who, what,.....etc. question to check, reading on and back in the story).

***4.*** Begin reading the passage together again. Stop at the marker and ask question 1. Before asking the children what the answer to the question is, ask them to recount what they should do before trying to answer the question. You should aim to get them to tell you that they would first think about what type of question it might be and from this, look for information in the story which would help them to find an answer.

***5.*** Hand out **Exercise 11** and get them to work independently. The passage has some deliberate errors, together with five questions. These are provided in the teacher's pack.

*6.* Reassemble the children and ask them together to go over the questions which accompanied the passage, pointing out how you would find the clues to answer the question. At the end of the discussion, ask the children if there was anything funny in the passage they have just read. If the children have been applying self- monitoring skills then they may already have queried this with you. If not it is important to highlight the errors, and point out that they should have spotted these if they had been listening to Mr. Homunculus.

# Exercise 12.

***Aim:*** *to explicitly state to children that the strategies learned from Mr. Homunculus can be used in all reading activities.*

**Instructions**

***1.*** As a discussion group, ask the children to think about when they might use Mr. Homunculus' skills. Ask them which ones they would use and when.

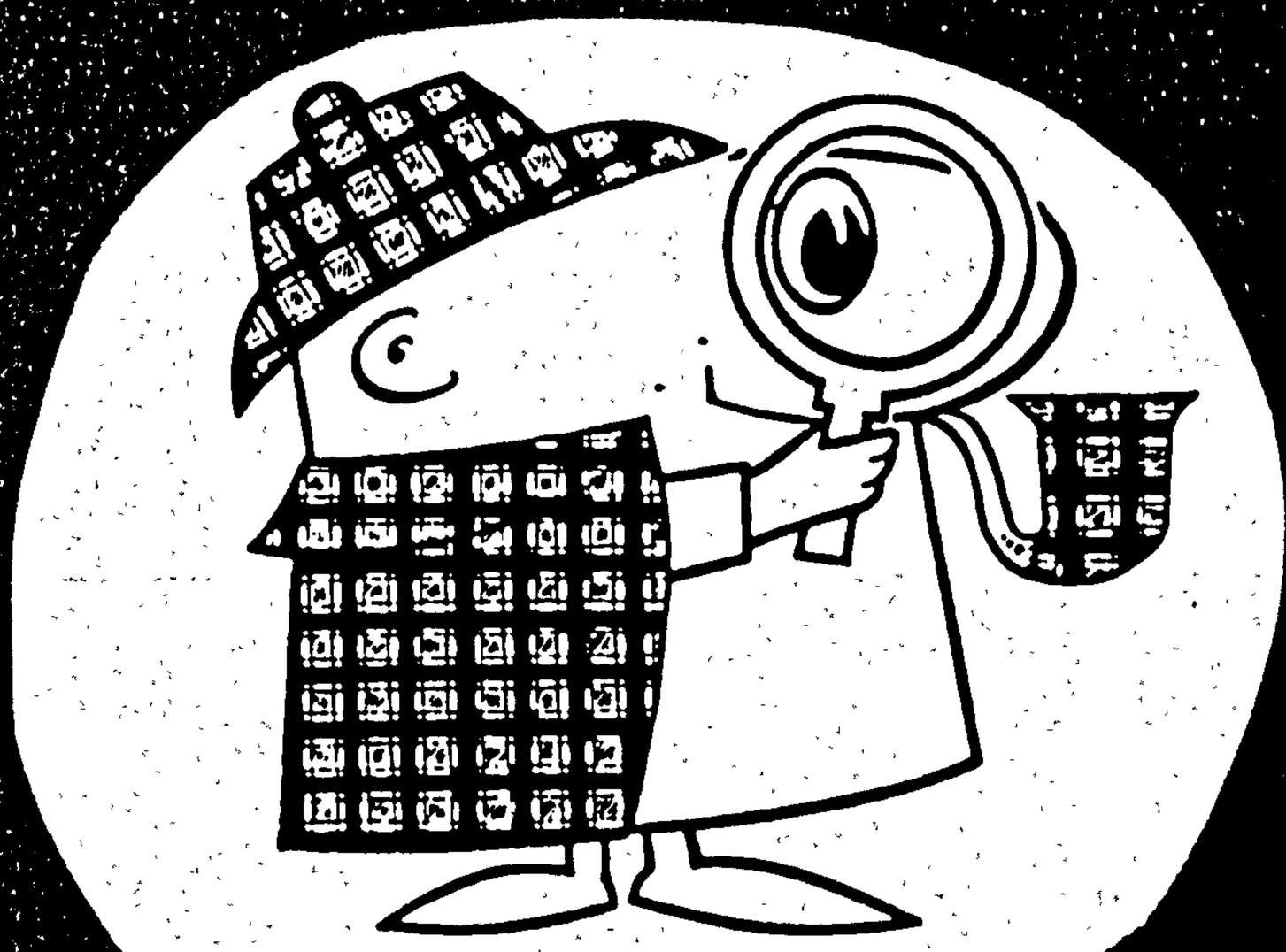
***2.*** Read to the children a short letter from your friend who is also a teacher. The letter describes a child who is having problems with a mathematics exercise because he doesn't understand what is written in his SPMG workbook. Ask the children if they could help you to advise your friend. You should be trying to draw out the reading skills which you have discussed previously.

***3.*** Ask the children to write a letter in reply to your friend, telling her how to help the little boy.

***4.*** At the end of the exercise, ask the children to come together again and remind them that when they are given anything to read in mathematics, topic work, religious education, science etc., they should remember Mr Homunculus the Reading Detective.

# Mr HOMUNCULUS - THE READING DETECTIVE:

## *Teacher's Pack*



## Passage A: Danny Fox Steals Some Fish

Danny Fox lived in a small cave on the side of a mountain near the sea. He had a wife called Doxie and three children who were always hungry. STOP Danny and Doxie were often hungry too. The names of their children were Lick, Chew, and Swallow.

Out on the mountain it was very cold, but in the cave it was warm and snug and Danny Fox liked to sleep curled up, with his nose tucked under his hind leg and his long bushy tail round his face like a scarf. STOP Mrs Doxie Fox liked to sleep curled up, with her nose tucked underneath Lick's chin and her front legs hugging Chew and her hind legs hugging Swallow. And Lick, Chew, and Swallow liked to sleep curled up like furry balls against their mother's tummy, while she covered their backs with her long bushy tail like a scarf.

STOP

One day the little foxes woke up early and began to whine and yelp and how.

'Why are you whinning, Lick ?' said Mrs Doxie Fox.

'I'm whining because I have nothing to lick,' said Lick to his mother, Mrs Doxie Fox.

'Why are you yelping, Chew?' said Mrs Doxie Fox.

'I'm yelping because I have nothing to chew,' said Chew to his mother.

'Why are you howling, Swallow?' said Mrs Doxie Fox.

'I'm howling because I have nothing to swallow,' said Swallow.

'Oh please stop whining and yelping and howling,' said Mrs Doxie Fox, 'and I'll ask your father to fetch some food. Wake up, Danny Fox. It is time to go hunting.';


'I'm not awake yet,' said Danny Fox, and his voice sounded muffled underneath his bushy tail.

'Then how did you hear what I said?' said Mrs Doxie Fox.

'I heard you in my sleep,' said Danny Fox. 'And now I'm talking in my sleep.' But he opened one eye and they knew he was only pretending. Lick, Chew, and Swallow thought he wasn't going to move, so they began their hullabaloo again.

'Oh please fetch some food,' said Mrs Doxie Fox.

'Lick, Chew, and Swallow need something to lick, chew and swallow, and I need something too.'

Danny Fox sat up and yawned. He stretched out his front legs and yawned and he stretched out his hind legs and yawned. Then he put his nose outside the cave and sniffed the cold air. 'Sniff, sniff I can sniff a rabbit.' He began to run faster and faster up the mountain side, sniffing the ground. Then he saw the rabbit, and yellped and ran faster than ever.

But the rabbit escaped by diving into a crack between two rocks. The crack was too narrow for Danny. He trotted along and he trotted along. Then suddenly he stood quite stood, with his bushy tail stretched out behind him and his long, smooth nose stretched out in front.

## Exercise 1: 'Sniff, sniff, I can smell..'

'Sniff, sniff. I can sniff a pigeon.' He looked and he looked and he saw a wood pigeon just below him on the hill pecking at the ground.


He walked very quietly, one step at a time. Then suddenly he sprang at the pigeon. But the pigeon saw him just in time and flew away, and Danny turned head over heels and rolled down the hill. 

'Sniff, sniff,' said Danny at the bottom of the hill 'I can sniff a mouse.' But the mouse ran into its hole.

He trotted along and he trotted along till he came to a farm at the foot of the mountain.

' Sniff, sniff. I can sniff a hen.' But the hen saw him and flew up to a branch of a tree. 'Sniff; sniff. I can sniff a duck.' But the duck waddled into the farmer's house, where Danny was afraid to go. 'Sniff, sniff. I can sniff a goose.' But the goose made such a noise that the

farmer came out to see what was wrong and Danny had to hide beneath a bush. I am unlucky this morning,' he said to himself. 'What can I find to take home?'

When the farmer had gone, he sneaked out of the farm yard and began to trot along the road. The road went along by the sea-shore, from the harbour to the town. 'Sniff, sniff. That's funny. I can sniff fish.' Danny trotted along and he trotted along, feeling very hungry. The smell of fish got stronger and stronger, and the more he smelt it the hungrier he grew. His mouth watered, his pink tongue hung out and saliva dribbled from it on to the road. He sniffed and sniffed and began to run fast. Then he came round a comer and suddenly stopped. He saw a horse and cart in front of him. The horse was walking very slowly, the driver seemed to be asleep and the cart was loaded with boxes of fish, all gleaming silver. Danny Fox

walked very quietly, one step at a time. Then he ran very quietly with his bushy tail stretched out behind him and his long smooth nose pointing up towards the cart. When he was near enough he sprang on to the cart and grabbed a fish from one of the open boxes. The driver did not look round. [redacted] Danny Fox lay down very quietly, hoping not to wake him. His plan was to eat one fish, then pick up as many as he could hold in his mouth and jump on to the cart and run home with them.

## Passage B: Danny Tricks the Fisherman

While Danny and Doxie were picking the fish up from the road, the cart went on towards the town. The driver with the curly black hair was a young fisherman who had been out all night fishing on the sea. [redacted] When he reached the market square in the middle of the town, he looked up at one of the windows of the tallest building and made a secret sign. The tallest building was the Royal Palace, and from the window, every morning, the Princess waved to him. [redacted]

Then the fisherman began to shout, 'Come buy my fresh fish. Fresh mackerel and herring! Come buy my fresh fish, caught early in this morning!' and the people came running out of their houses with dishes and pans for the fish and money for him. But when they saw there were no fish on the cart they began to laugh, and other people came running out into the

street to see what they were laughing at until the poor fisherman and his horse and cart were surrounded by a crowd of laughing people. [redacted] He stood up on the cart and said, 'It isn't right to laugh at me.' But the people said, ' You have no fish. Why did you call to us to buy your fresh fish when you haven't any?'

'I caught a lot of fish last night,' said the man. 'My cart was filled with fish.'

But the people said, 'We don't believe you.'

Then he told them how he had found a large dead fox and thrown him on to the cart.

'Then where is the dead fox?' the people said.

'Your cart is empty.'

'He must have come alive again and eaten all my fish. [redacted]

This made the people laugh again. Only the Princess waved from her window in the palace to show she believed what he said.

The poor young fisherman had to drive all the

way home without earning any money. He said to himself; 'If I see that fox again, I'll catch him. Then I'll take him to the town and show him to the people and make them believe I am telling the truth.' He went home and lit the fire and sat beside it thinking of ways to catch Danny Fox.

## Passage C : Danny is Full

His house was small. It had a front door opening out on to the beach and a back door leading to a stony foot path which went up the mountain towards Danny Fox's den. But which ever door you went in by, you found yourself in the same room, because there was only one room in the house. The back door had a lock at the bottom to allow the fisherman's dog to come in and out. The fisherman's bed was beside the back door against the wall.

He felt lively because he had been out fishing all night, so after he had warmed himself at the fire, he took off his clothes and went to bed. He lay in his bed thinking, 'I wish Danny Fox would walk my house into. Then I'd catch him. If only wishes came true!' And then he felt very lively and fell asleep. He slept until the evening. Eaten Danny Fox had so many fish in the morning that he fell till the evening too

asleep. Then, just as the sun was going down, he went for a walk. He walked and walked till he came to the farm. And the duck and the goose and the hen were watching him.

'Look out,' said the buck, 'there goes Danny Fox.'

'That's funny,' said the goose, 'he has a football'

'That's not a football,' said the hen.

'Yes, it is,' said the goose.

'Yes, it's not,' said the hen.

'What is it, then?' said the duck.

'It is all the fish he has drunk,' said the hen, 'making his tummy bulge.'

Danny walked past the mouse's hole. The mouse was peeping out.

'That's funny,' said the mouse, 'I can see a football rolling along. But it's got legs like a fox.'

But an old mother ewe, who was on the mountain there path, said, 'That's not a

football; that's a fox, and I'm not going to let him come any farther in case he tries to take my lamb away.'

When Danny Fox heard this he walked up to the old mother ewe and said, 'You needn't worry, Mother Ewe. I will take your lamb. I am not a bit hungry. And Doxie's not hungry, because we've got plenty of fish. So please let me pass.'

But the old mother ewe would not believe him. She stood in the of the path middle and lowered her head. She was ready to butt him. Danny Fox could easily have got past her by stepping off the path into the heather. But he felt cross because she would not step to one side and let him pass.

' Get out of my way,' he said. ' Or I'll bite you.'

'Go back the way you came,' she said, 'or I'll butt you and trample on you with my hoofs.'

Danny Fox growled fiercely. The old mother ewe made a rush at him, but he jumped on to

her back and tried to bite her. His teeth sank into her thick wool and did not hurt her a bit, but he would not let go.

'If he holds on like this,' thought the old mother ewe, 'I can carry him away from this place.'

## Exercise 2: Danny Gets Giddy

She started to run down the mountain path towards the beach, with the fox clinging on to her wool. She ran very slowly.

Danny Fox didn't mind. He enjoyed the ride. He said to himself, 'She will soon get tired and then she will have to go back up the mountain to the place where she lives and I won't let go she brings me back till.' But the path led down to the fisherman's house near the bleach, and when they got there the young ewe started baaing for help. The fisherman was st . awake and did not hear her.

'Get off my back,' she said. Danny knew if he had spoken he would have to let go, so he did not answer 'If I carry you and stop outside your den home, will you let go?'

He gave a rug at her wool, which meant 'Yes'.

'Then I'll start running,' she said, 'and I won't stop till I'm outside your den,'

But of running instead, up the mountain again she ran round and round the fisherman's house. Round and round and ground she ran until Danny Fox began to feel giddy. Round and round and round she ran until the had sun, gone right down and everything was dark. Round and round and round she ran, tin Danny Fox was so giddy he thought he would have to let go. Then suddenly she stopped outside the fisherman's back door. Danny Fox was glad to let go. He slid off her back on to the ground. Now he was so giddy that he couldn't stand straight. He wobbled and staggered and, instead of going round and round the fisherman's house, the fisherman's house went round and round him.

# Passage D: Danny Meets the Princess

It was in the middle of the night when Danny got home. Lick, Chew, and Swallow had been sound asleep all the time, but poor Mrs Doxie Fox lay awake worrying because Danny was away so long. STOP

'What have you been doing?' she said when she saw him.

'Nothing much,' said Danny and he gave a big yawn to show he didn't want to talk. He was afraid she might laugh at him if she heard how the old mother ewe had tricked him. He made a yowling kind of noise when he yawned and his white teeth shone in the darkness. STOP

'Well, you haven't been out hunting, I should think,' said Mrs Doxie Fox. 'Not after all that fish.'

'No, I haven't been out hunting,' said Danny Fox and this time he shook himself and sneezed to show he didn't want to talk, and when he shook

himself a cloud of ashes from the fisherman's fireplace flew out of his coat and made Mrs Doxie Fox sneeze too. [redacted] He sneezed and she sneezed and she sneezed and he sneezed and they both sneezed together and made such a noise that the children woke up, and Lick and Chew sneezed and Swallow sneezed too. And then Mr. Danny Fox and Mrs Doxie Fox and Lick, Chew, and Swallow all sneezed together, and made such a loud noise that all the animals and birds who stay awake at night - such as the mouse and the rat and the owl and the cat, and the nightjar and the bat, and the polecat, the nightingale and mole, and water-vole, and the weasel and the hedgehog, and the badger and the bullfrog - left whatever they were doing and came to the door of the foxes' den to listen. And this is what they heard: [redacted]

'I can smell burning!' (It was Lick who said

that.)

'It's someone's fur burning!' (It was Chew who said that.)

'It's Daddy. It's Daddy. Oh Mummy, he's on fire!'

It was Swallow who said that in his high yelping voice. STOP 'He's not on fire, said Mrs. Doxie Fox. 'But, Danny I'm afraid you've singed your beautiful red coat, and, oh, you are covered with ashy dust. A-tishoo!'

'If I've singed my red coat, said Danny Fox, 'it is because I'm the bravest and cleverest creature in the world.' CHILD

'Oh yes! You are brave and clever,' said the children. 'Oh tell us what you have done.'

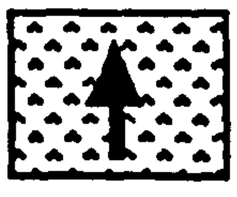
So he told them how he had escaped from the fisherman's house.

'I think you are too brave and clever,' said Mrs Doxie Fox. 'If you think you are so brave and clever, one day you'll be caught.'

When the animals and birds who were crouching at the door heard her say that, they

laughed loudly. And when Danny Fox heard them he rushed out barking and snarling and curling up his lip to show his fierce white teeth. CHILD Those who could run ran away and those who could hop hopped away, and those who could fly flew away. No one was brave enough to laugh while Danny Fox was near. And Danny walked back into his den, very stiffly and proudly with the hair of his neck and back standing up on end.

# Exercise 3: Danny Meets The Princess

Danny Fox was the first to wake up in the morning. Just as the sun began to rise he walked down the mountain path, sniffing the morning air and standing still every now and then on three legs,  with one front paw dangling, to look into the distance. He saw the fisherman's cottage below him and beyond it the sea, which was pale blue grey, with a long bright streak across it, like a golden iver.  The golden river was really the sunlight reflected on the water as on a mirror. The sun had just come up on the horizon. Only half of it showed above the water, like half a plate made of gold. In the middle of the sea, a long, long way away Danny Fox saw a dark blue blob sticking up out of the water. He did not know what it was. Whenever he went for a walk he

looked at everything, the near things and the far things, and if he didn't know what something was, he felt secretly frightened. But he never told anyone that. If the thing moved he was very frightened. If it didn't move he was only a little bit frightened. 

The dark blue thing sticking out of the sea did not move at all because it was an island. But Danny Fox was a little bit frightened because he didn't know what an island was. 

Then he heard a noise quite near him, and smelled a smell he had never smelt before, and saw a strange thing bobbing up and down behind a rock. The noise was made by the Princess. She had knelt down behind the rock to watch him and by mistake her knee had touched a dry twig which broke with a crack. 

The smell was the smell of a precious scent called *Crepe de Chine* which she dabbed behind her ears every morning. And the strange thing which Danny Fox saw bobbing up and down

behind the rock was the crown she wore on her head. The Princess had never been so near a wild fox before and she was trying to hide from him and to watch him at the same time.

She thought him beautiful.

# Exercise 4: Danny Flies Away

The whole of the sun had risen above the sea by now, but it was not yet high in the sky, and the shadows it cast on the mountain side were very long. Even a small stone had a shadow ten times as big as itself and Danny Fox, when he looked at his own shadow, was prouder of himself than ever, because his legs seemed longer than a wolf's, the shadows of his teeth were like long daggers, and his ears looked big and frightening like sharp horns. But suddenly the whole lovely, big, fierce shadow of Danny Fox was blotted out by a really terrible shadow that came down from something in the sky. Danny Fox crouched with his tummy to the ground and crept into a big clump of whins. He sniffed and he sniffed and he lay down on the prickly ground beneath the whinbush and rested his chin on the back of his front paws, and he sniffed. He peered and

peered out from a gap between the yellow flowers of the whin and he saw the shadow of a bird with two gigantic wings.

'Sniff, sniff,' said Danny in the whinbush, and the prickles were prickling his tummy. ' Sniff, sniff. I can sniff an eagle, and even if the shadow of that eagle is ten times as big as the eagle, I'm going to hide here till he's gone.'

The King Eagle, the golden eagle, whose wings if he stretched them out from tip to tip would reach from the pillow to the foot of a grown-up person's bed, had seen Danny Fox and decided to give him a fright. He knew, and Danny knew, that the golden eagle is the only bird strong enough and brave enough to pounce down from the sky on a fox and pick him up in his claws and fly away with him. But the King Eagle didn't want to do that. He only hovered over Danny Fox for fun . . . to see what Danny would do when he was frightened.

# Passage E: Danny Is Marooned

Danny Fox was hungry. He hadn't had his usual Eagle's egg. In fact, he hadn't had any bread at. all, and on the little island he couldn't smell anything except grey rock and he couldn't smell anything that smelt like food. When he put his nose in the air to sniff for food the wind was so strong that he could hardly breathe. He turned his back to the wind and sniffed towards the middle of the island.

'Sniff, sniff,' he said, 'I can only sniff fresh air.' Then he turned his left side to the wind and the wind ruffled his red coat, showing a yellow furry lining underneath, and he sniffed towards the beach.

'Sniff, sniff,' he said, 'I can only sniff seaweed.' Then he turned his right side to the wind and the wind ruffled the other side of his red coat, showing another bit of yellow furry lining, and

he sniffed towards the other part of the beach.

'Sniff, sniff,' he said, 'I can only sniff seaweed there too.'

'Don't you like the smell of seaweed?' said a voice.

'Only after breakfast,' Danny Fox said. He put his head on one side to listen. Then he looked all about him and turned round and round, but he couldn't see anyone at all. He couldn't smell anyone either. STOP

'Who's there?' he said. 'Sniff, sniff. I can only sniff fresh air.'

'Don't you like fresh air?' said the voice.

'After meals it's all right,' said Danny Fox. 'But if you have too much of it, it makes you hungry.'

'Why don't you shut your nostrils then, until you've caught a fish?'

'Shut my nostrils?' said Danny. 'I can keep my mouth shut sometimes, but not my nostrils.'

'You can't be much of an animal,' said the voice

'And you're not much,' said Danny Fox, 'because I can't even see you. And I can't smell you. You are nothing.' [redacted]

'Can't you open your eyes?'

' Of course I can open my eyes.'

'And shut them?'

'Of course I can.'

'But not your nostrils? You can't open and shut your nostrils!' said the voice and laughed at him.

## Exercise 5: Danny is Marooned Continued

'But not your nostrils? You can't open and shut your nostrils!' said the voice and laughed at him. 'Of course not,' said Danny Fox crossly. 'Nobody can.'

'Sea animals can,' said the voice. 'Just open your eyes and look down, at the water.'

Danny Fox heard a noise of someone blowing bubbles under water. Then he trotted down over the rocks to the edge of the sea, with his long smooth nose stretched out in front of him and his bushy tail stretched out behind, and he saw a round head which seemed to be floating on the sea, with two brown eyes that gazed at him and a wide whiskery mouth. 

'Sniff, sniff,' said Danny Fox. 'I can smell fish.'

'No, you can't,' said the whiskery mouth in the sea, 'you can probably sniff me, because I eat so many fish. I am a seal, a *Phoca barbata*.'

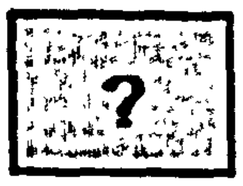
'I beg your pardon,' said Danny. He was always

very keen to learn words he'd never heard before. He liked to go home and use the new words when he spoke to Lick, Chew, and Swallow. He liked to hear them say, 'What does that mean?' and then he would tell them the meaning.

'What does that mean?' he said to the whiskery head.

'A *Phoca barbata* is a seal - a bearded seal, one of the largest of all the seals - and one of the fattest. You'd better remember that, because if you're going to live on this 'sland you may need me.'

'Did I hear you mention catching fish?' said Danny Fox. He put on the sweetest voice he could imagine. He was trying to talk like the Princess. But the seal said, 'Why are you talking in that funny way. Watch my nose.'



# Passage F: Danny's Bridge Across the Sea

'Now,' said the seal. 'You think there are more kinds of animals on the land than in the sea. Don't you?'

'Yes,' said Danny Fox with his mouth full

'Well,' said the seal. 'When you've finished eating, look over there.'

Danny Fox finished eating and looked up and saw a mighty commotion in the sea. One minute it was full of bobbing heads and splashing bodies like a crowded swimming pool, and the next minute it was bubbling and squirting and gushing and swashing like a washing machine full of different coloured clothes. The highest squirts came from the whales who blew tall fountains of water into the air and the longest line of splashes came from the dolphins who jumped in and out of the

water as they raced along. And all the other animals that lived in the sea were playing and gurgling or fighting and squalling or bubbling and slushing and squishing and squashing, or fishing and guzzling or pushing and nuzzling or cuddling or muddling and paddling and puddling along.

Danny Fox couldn't tell whether he was watching a million animals all jumbled up, or one immense animal that kept on falling to bits and joining together again.

'Well, count them,' said the seal.

'How can I count that muddle' said Danny Fox.

'Line them up and tell them to keep still. The seal began to line them up round the shore of the island with their noses to the beach. But he told the whales not to come too near.

'If they run aground in shallow water we shall never get them off again,' he said to Danny Fox.

'I quite agree, Mr. Phoca Barbata,' said Danny.

'In fact I think it is dangerous for any of these animals to come near the shore.'

'The seals don't mind,' said the seal. 'We can walk on the land quite well.'

'How many kinds of seals have you brought?' said Danny Fox.

'I've brought the common seal, and the fur seal and the hair seal and the harp seal and the golden seal.'

'Tell the common seal to put his front feet on the beach,' said Danny Fox. 'The fur seal and the hair seal and the harp seal and the golden seal can line up behind him in the sea. Then some other animals can go behind them until the line reaches water deep enough for whales.'

'And I've brought the marbled seal, the monk seal, the Atlantic grey seal and the elephant seal and the bottle nosed seal,' said the seal.

'The bottle-nosed seal?' said Danny Fox, with his head on one side.

'And the sea leopard - and that's all the seals I've brought.'

'The sea leopard? What's that?' said Danny Fox.

'It's another name for the South Sea seal' said the seal 'You've heard of the sea lion, I suppose?'

' Of course,' said Danny Fox.

'Nearly all sea animals have two names,' said the seal. 'And one of those names comes from a land animal.'

'Tell the sea leopard to swim to that land over there where my home is and put his front paws on the beach,' said Danny Fox, 'and the marble and monk and elephant and grey and bottle-nose can line up behind him. Then if all the others can bridge the gap between those two lots of seals I'll admit there are more animals in the sea than on the land.'

## Passage G: The Fisherman Tricks Danny

Danny Fox was so hungry and tired after his long walk over the bridge of animals that he did not notice that he had landed on the beach just below the fisherman's house. He did not notice the fisherman's boat on the sands, nor his cart which was beside the house. And he walked very slowly up the beach, trying to think of a plan to get something to eat. The seal shouted after him, 'Now bring an the land animals here for me to count.'

'Oh, go away,' said Danny Fox.

The fisherman was sound asleep inside his home. He had been out fishing most of the night but had not caught any fish because the seals and dolphins and porpoises had chased them all away. And when the whales arrived in the early morning, he had started up his engine in a hurry and rushed home, afraid that they might upset his boat. So instead of

driving to town to sell fish as usual, he had gone to the mill with his horse and cart to fetch some crushed oats. And when he came home from the mill and unloaded the sacks from the cart, he had spilt some of the oats on to the ground outside his door. Then he had gone to bed. STOP

The fisherman had a cock and two hens. When the cock saw the oats on the ground he went 'cluck, cluck, cluck' to call the hens to the feast. He made such a loud noise that the duck and the goose and the hen who lived on the farm heard him too, and they all came running down to the fisherman's house to see what they could find to eat. And there they all were, picking up oats in a greedy hurry, when Danny Fox arrived.

# Passage H: Danny is Tricked

'Look out,' said the duck. 'There goes Danny Fox.'

'That's funny,' said the goose. 'He has swallowed a safety pin, and it's pinned the two sides of his tummy together and made him look thin.'

'That's not a safety pin,' said the hen.

'Yes, it is,' said the goose.

'No, it's not,' said the hen.

'What is it, then?' said the duck.

'It's just thinness,' said the hen. 'He's had nothing to eat for days and days and days, except one small fish for breakfast this morning.'

'How do you know?' said the duck.

' She doesn't,' said the goose.

'Yes, I do said the hen.

'No, you don't,' said the goose.

'Yes, I do,' said the hen. 'The sea robin told me this morning.'

And the fisherman's cock, who had said nothing this time, suddenly shouted, 'Run away! Quick And stop arguing.'

The fisherman's cock had seen Danny Fox just in time. Danny Fox had heard their voices and stood still. Then he had started stalking them, coming towards them very slowly, with his skinny nose stretched out in front and his poor threadbare tail stretched out behind him.

And now the goose and the duck and the hens all ran away cackling and squawking, and the fisherman's cock flew up and perched on the side of the cart.

# Exercise 8: The Fox in a Box

Danny Fox said to the fisherman, 'I hope you're not going to show me like this to the Princess and the people of the town?'

'Like what?' the fisherman said.

'When you first found me,' Danny Fox said, 'you spoke about my beautiful red coat and my beautiful thick red trousers. What will the townspeople think if they see me like this? I'm so worn and thin.'

'Yes, you look a bit rotten and mangy the fisherman said.

'And look at my beautiful long bushy tail. Half the hairs have fallen out!'

'Yes, it looks like an old toothbrush that someone has thrown away,' the fisherman said.

'Well, you can't let the Princess see me like this. You must give me lots to eat and let me run about, till I grow fat and glossy again.'

'I'll feed you,' said the fisherman, 'but I won't

let you run about or you'll escape.'

But he hadn't caught any fish for two nights and he was so poor that all he could find to give to Danny were some old potato peelings and a hard stale crust.

When night time came the fisherman went out in his boat. 'Tomorrow, I'll take you to town with my horse and cart,' he said to Danny Fox. He left the dog on guard. 'You watch Danny Fox doesn't bite his way out through the bars,' he said to his dog.

As soon as Danny Fox heard the engine of the motor boat fading away out to sea he began to bark and howl inside the tub.

'Be quiet,' said the dog. 'What's the matter with you?'

'I'm hungry,' Danny Fox said.

'So am I,' said the dog. 'I only had potato skins and a crust of bread for dinner. But I'm not making a fuss.'

'A crust of bread!' said Danny Fox. 'That's

funny. Your master gave me a huge big meal'

'He didn't!' said the dog.

'Yes, he did,' said Danny Fox.

'No, he didn't,' said the dog.

'Yes, he did,' said Danny Fox.

'No, he didn't,' said the dog.

'Yes, he did,' said Danny Fox. 'He gave me a whole chicken all to myself, and a big piece of salmon, and a hunk of cheese as thick as your head.'

# Exercise 9: The Escape

The dog felt hungrier and hungrier as he listened to Danny Fox.

'How would I get into the tub?' he said

'Can't you pull out the nails with your teeth?' said Danny Fox. 'And loosen a couple of bars?'

The dog pulled at the nails and they came out easily. Danny Fox pushed the bars aside with his nose and jumped out.

'Now in you get,' he said to the dog, and the dog jumped into the tub.

'Luckily the tip of your nose is black like mine,' said Danny Fox. 'If you lie down till your breakfast comes the fisherman will think you are me.'

'Oh thank you,' said the dog. 'You are kind.'

Danny Fox pushed the bars back into position. He tried to nail them down again, but of course he couldn't.

'Remember to lie quite still,' he said to the

dog. 'Don't move or make a noise, what ever happens.' Danny Fox ran away and left him there.

The fisherman came home in the early morning, just as it was beginning to get light. But inside his house it was still rather dark. He could not see very much. But he did notice that two of the bars had come loose. He peered into the tub to make sure that the fox was still there, and when he saw a black nose in the shadowy darkness, he said to himself, 'That's all right, he's asleep.' Then he fetched his hammer and made the bars firm again. Then he covered the tub with a sack and carried it out to his cart.

He loaded the cart with boxes of fish And he took a large, old fishing net with him as well. He had caught plenty of fish that night and he set out for the town, happily thinking, 'First I'll sell my fish. And then I'll take the sack off the tub and let the people see what a big fox

I've caught.'

Danny Fox had been hiding outside the back door all this time, waiting to see what would happen. When he saw the fisherman start off for the town, he ran by a short cut across the fields, as fast as he could go. The horse and cart was slow and Danny Fox was quick and Danny Fox arrived at the market place in the middle of the town in the early morning before any of the people were awake. He was looking for a good place to hide in and watch what would happen when the fisherman discovered the dog in the tub.

Suddenly he heard a voice that seemed to come from the sky.

It was the Princess calling to him from her bedroom window in the Palace.

'Good morning, Mr. Fox,' she said.

Danny looked up and saw her with her elbows on the window sill, watching him.

# Exercise 10: Passage K- Danny Helps the Princess

The fisherman called to the Princess. 'May I come into your palace and catch the fox again?' he said.

But the Princess made signs to show it was too dangerous. She thought the Queen might find him in the palace and lock him up in prison.

'I'll try to catch him for you,' she said. 'I think he is in the cupboard, or under the bed.'

Then she heard Danny Fox whimpering under the bed. Then she saw his nose sticking out.

'Yes, there he is,' she said, 'I'll throw him out of the window. He won't hurt himself if you catch him in the net.'

'Please don't throw me out,' said Danny Fox.

'Why not? You tricked him, didn't you?' the Princess said.

Then Danny Fox came up to her and licked her

hand. He told her how he had tempted the dog and made him get into the tub. The Princess wanted to be cross with him but she could not stop herself laughing. [illegible]

'I am clever, aren't I?' Danny Fox said.

The Princess tried not to laugh.

'If you let me go, and don't throw me down,' said Danny Fox, 'I'll make your best wish come true.'

' What do you mean?' the Princess said.

'What would you like best in all the world?' said Danny Fox.

'That's a secret,' the Princess said.

'If you tell me the secret, I can make it come true,' said Danny Fox.

The Princess knelt on the floor beside him and whispered in his ear.

'I want to marry the fisherman,' she said. And then she sneezed because Danny Fox's furry ear tickled her nose. [illegible]

'That's simple,' said Danny Fox. 'I'll fix it up for

you.'

'You couldn't do that,' the Princess said. 'My step mother, the Queen, won't allow it.'

'Is your stepmother clever at tricks?' said Danny Fox.

'No, she's stupid and horrid,' the Princess said.

'She wants me to marry a very rich man.'

'Why doesn't she like the fisherman?' said Danny Fox.

'Because he is poor,' said the Princess.

'Then I know how to make her like him,' said Danny Fox.

'How?' said the Princess.

# Passage J: Danny Fox Goes Home

The Princess came with Danny Fox to the door of the Palace, to say 'Good-bye'. She opened a chest beside the front door and began to sort out a pile of sacks made of fine silk in every colour of the rainbow. [redacted] She filled five silken sacks with food for him to take home - a red sack of food for Danny, a yellow one for Mrs Doxie Fox, a green one for Lick, a blue one for Chew, and a violet one for Swallow. Then she filled five other sacks with sump··ous wedding cake, with white icing and pink icing, and 'hundreds and thousands' of every bright colour one sackful for Lick, one for Chew, one for Swallow, one for Mrs Doxie Fox, and one for Danny. [redacted]

'How on earth will you carry them all?' the Princess said to Danny.

'I'll take the biggest one in my mouth,' said Danny Fox. 'Please tie the others on to me.'

# Exercise 11

So the Princess tied three silken sacks round his chest, a red one on his back and yellow ones against his ribs on each side. And she tied three then round his middle - another red one on his back, and two ween ones against his tummy. And then she tied three to his tail - a blue one at the top, a violet one on its bushy middle part and another blue one at its beautiful white tip.

'And now,' said the Princess, 'you like a prince look in a coat of many colours, but I think that's too big a load for you to carry up the mountain.'

'I've shown you how stupid I am,' said Danny Fox. 'And now I can show you how strong I am.'

'All right,' said the Princess. 'But wait a minute. I haven't given you your special present yet.'

'What can that be?' said Danny Fox. He couldn't wag his tail because the silken sacks were too heavy.

The Princess went away and came back holding her crown.

'This is for you,' she said, and put it over his head. 'You'll have to wear it like a necklace, as before, because your head is too small.'

Danny Fox was terribly pleased. 'Do I REALLY look like a Prince?' she said. And the Princess bent town and kissed his furry red forehead.

# Exercise 8

**1. Why did Danny lie to the dog about what he had for dinner?**
Thinking

***Answer: To try and make the dog jealous, to trick him***

**2. Why did Danny look so rotten and mangy?**
Thinking/Me

***Answer: Because he hadn't had much to eat (Thinking), and this would have resulted in a low nutrient intake (Me)***

**3. Why is it best to fish at night?** Me

***Answer: Because the fish are not frightened away by shadows***

**4. Why did the fisherman go out in his boat when night time came?** Thinking

***Answer: To catch some fish***

**5. What had happened to Danny's beautiful long bushy tail?**
Given

***Answer: Half the hairs had fallen out of Danny's beautiful long bushy tail***

**6. What colour is salmon?** Me

***Answer: Pink***

**7. Who did the fisherman leave on guard?** Given

***Answer: The fisherman left the dog on guard***

**8. Why did Danny bark and howl as soon as he heard the engine of the motor boat fade away?** Thinking

***Answer: To get the dog's attention and/or because he was hungry***

**9. How many nights had the fisherman not caught any fish?** Given

***Answer: The fisherman had not caught any fish for two nights***

**10. How do you think the dog felt when Danny told him about the feast which he had been given to eat by the dog's master?** Me

***Answer: Hurt, Angry, Upset, Let-down etc***

Passage J Exercise 9 Danny Fox Page 87 to 89

# Exercise 9

**1. Why did Danny advise the dog to lie quite still?** Thinking

***Answer: So that the fisherman wouldn't know of the switch***

**2. Was Danny really being kind to the dog?** Thinking

***Answer: No - he just wanted to get out of the box***

**3. Why was it lucky that the dog's nose was black like Danny's?** Thinking

***Answer: Because the fisherman wouldn't know about the switch***

**4. What did Danny push aside with his nose?** Given

***Answer: The bars***

**5. Where do we usually buy fish?** Me

***Answer: In the supermarket, a fish shop/mongers etc***

**6. What did Danny do when he saw the fisherman start off for the town?** Given

***Answer: He ran by a short cut across the fields***

**7. What will the town people do when the fisherman takes the lid off the box to show them the fox?** Thinking

***Answer: Laugh etc***

**8. Was the dog really asleep when the fisherman came back from fishing?** Thinking

***Answer: No: he was keeping quiet as Danny had told him to do***

Passage J Exercise 9 Danny Fox Page 87 to 89

**9. Do dogs make the same noises as foxes?** Me

***Answer: No***

**10. When did the fisherman come home from his fishing trip?** Given

***Answer: The fisherman came home in the early morning***

# Exercise 11

1. What did the Princess tie around Danny's chest? Given

*A: The Princess tied three silken sacks round his chest*

2. Why did the Princess say Danny looked like a prince in a coat of many colours? Thinking

*A: Because all the sacks attached to him were different colours.*

3. Why would Danny's head being too small mean that he would have to wear the crown as a necklace ?Thinking

*A: Because the crown would fall down over his head*

4. What animal produces the material from which we make silk? Me

*A: Silk worms*

5. How was Danny going to show the Princess how strong he was? Thinking

*A: By carrying the sacks up the mountain*

Danny Fox page 23 to 25

# Passage E: Exercise 5: Questions for Use by the Class-teacher

**1. What ruffled Danny's red coat?**

***Answer: The wind***

**2. Where was Danny?**

***Answer: On a little island***

**3. When does Danny like the smell of seaweed?**

***Answer: After breakfast***

**4. Who couldn't see anything except grey rock?**

***Answer: Danny Fox***

**5. Why did Danny keep turning round to sniff**

***Answer: To see if he could smell any food***

**6. How did Danny Fox feel?**

***Answer: Hungry***

Danny Fox pages 63 to 65 : Passage F Exercise 6

# Passage F - Examples of questions

**1. Who saw a mighty commotion in the sea?**
***A: Danny Fox***

**2. Why was Danny told to line up the seals and tell them to keep quiet?**
***A: So that he could count them***

**3. Who were playing and gurgling,or fighting and squalling?**
***A: All the sea animals***

**4. What is a sea leopard?**
***A: A south sea seal***

**5. Where did the seal line up the animals?**
***A: Around the shore***

**6. Why was it dangerous for the whales to go near the shore?**
***A: Because the might dry out***

**7. What was the sea leopard to do when it reached the seal's home?**
***A: Put his front paws on the beach***

**8. How was Danny to count the seals?**
***A: By lining them up***

**9. Why could Danny Fox not tell if he was watching a million animals all jumbled up, or one immense animal falling to bits?**
***A: Because there were so many of them***

**10. How many different kinds of seal had the seal brought?**
***A: Five types***

Danny Fox Passage G page 74 to 75

# Passage G: Questions for use by the class-teacher

**1. How did Danny walk up the beach?** Given

***Answer: He walked very slowly up the beach***

**2. What did the seal shout after Danny Fox?** Given

***Answer: The seal shouted after him, "Now bring all the land animals here for me to count"***

**3. Why did the fisherman not drive to town to sell fish as usual?** Thinking

***Answer: Because he had not caught any fish due to the noise***

**4. When did the fisherman spill some of the oats on to the ground?** Thinking

***Answer: When he unloaded the sacks from the carts***

**5. What sex is a cock?** Me

***Answer: A male***

**6. What other food do cocks and hens eat?** Me

***Answer: Grains etc***

23, East Side Street,
Croydon,
London

Dear

Hope you are all well and had a good holiday. We went to Spain this year and had a wonderful time, except for the fact that John had a touch of sunburn. However after a few days in the shade, he was back in the sand, building sandcastles and throwing sand at his little sister!

Enough of the chit chat. I have a problem with one of my primary five children and wondered if you could help. He does not seem to be able to read his maths workbook. At least, he will read it out aloud but doesn't seem to understand it. Sometimes he reads large sections of it without stopping, and he doesn't even realise that he isn't keeping track of what he is reading. It is making me mad, because I am sure he could do better and would really like to help him. Any suggestions?

Yours,

Anne

# Exercise 7

**1.What did the goose think Danny Fox had swallowed?** Given

***Answer: A safety pin***

**2, Why did the fisherman's cock shout: "Run away: Quick! And stop arguing"?** Thinking

***Answer: Because he had seen Danny Fox who might have eaten them***

**3. Who ran away cackling and squawking?** Given

***Answer: The goose and the duck and the hens ran away cackling and squawking***

**4. Was Danny Fox full up from eating so much?** Thinking

***Answer: No: because he had not eaten for days and days***

**5. What does stalking mean?** Me
***Answer: to track***

**6. What was Danny Fox hoping to do?** Thinking

***Answer: To kill the birds for food***

**7.What is a sea robin?** Me

***Answer: type of seal***

**8. Why did the goose think Danny Fox had eaten a safety pin?** Thinking

***Answer: Because he looked so thin. She thought the safety pin was pulling his stomach together***

**9. Can foxes run faster than dogs?** Me

***Answer: Yes***

**10. What was stretched out behind Danny Fox when he stalked the birds?** Given

***Answer: His poor threadbare tail***

Danny Fox Passage H Exercise 7 Page 75 to 76

# Exercise 7

**1.What did the goose think Danny Fox had swallowed?**

Given Thinking Me

**2. Why did the fisherman's cock shout: "Run away: Quick! And stop arguing"?**

Given Thinking Me

**3. Who ran away cackling and squawking?**

Given Thinking Me

**4. Was Danny Fox full up from eating so much? 5. What does stalking mean?**

Given Thinking Me

**6. What was Danny Fox hoping to do? 7.What is a sea robin?**

Given Thinking Me

**8. Why did the goose think Danny Fox had eaten a safety pin?**

Given Thinking Me

**9. Can foxes run faster than dogs?**

Given Thinking Me

**10. What was stretched out behind Danny Fox when he stalked the birds?**

Given Thinking Me

Passage I Exercise 8 Danny Fox Page 84 to 85

# Exercise 8

1. Why did Danny lie to the dog about what he had for dinner?

| Given | Thinking | Me |
|---|---|---|

2. Why did Danny look so rotten and mangy?

| Given | Thinking | Me |
|---|---|---|

3. Why is it best to fish at night?

| Given | Thinking | Me |
|---|---|---|

4. Why did the fisherman go out in his boat when night time came?

| Given | Thinking | Me |
|---|---|---|

5. What had happened to Danny's beautiful long bushy tail?

| Given | Thinking | Me |
|---|---|---|

6. What colour is salmon?

| Given | Thinking | Me |
|---|---|---|

Passage I Exercise 8 Danny Fox Page 84 to 85

**7. Who did the fisherman leave on guard?**

Given Thinking Me

**8. Why did Danny bark and howl as soon as he heard the engine of the motor boat fade away?**

Given Thinking Me

**9. How many nights had the fisherman not caught any fish?**

Given Thinking Me

**10. How do you think the dog felt when Danny told him about the feast which he had been given to eat by the dog's master?**

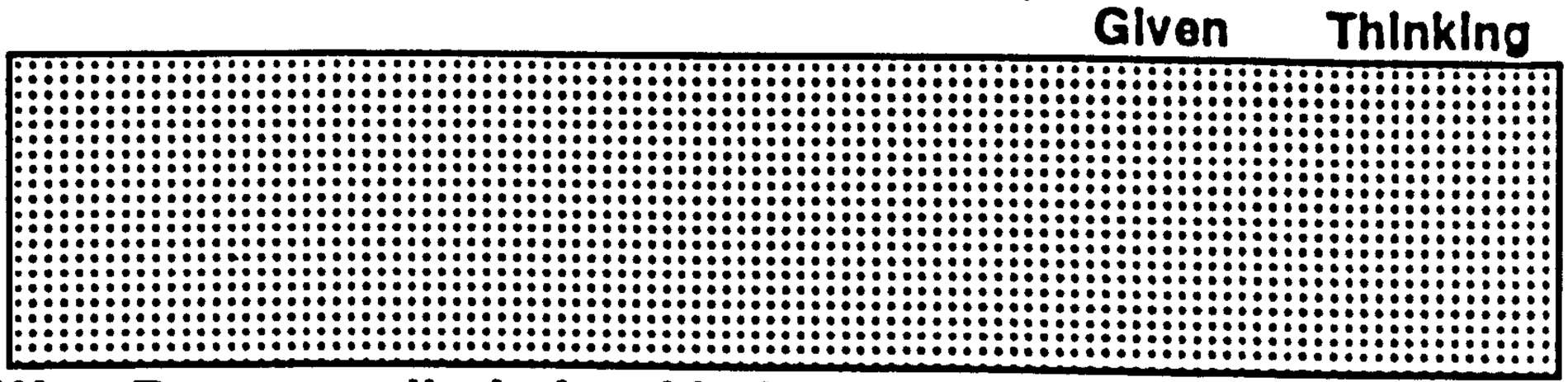
Given Thinking Me

Passage J Exercise 9 Danny Fox Page 87 to 89

# Exercise 9

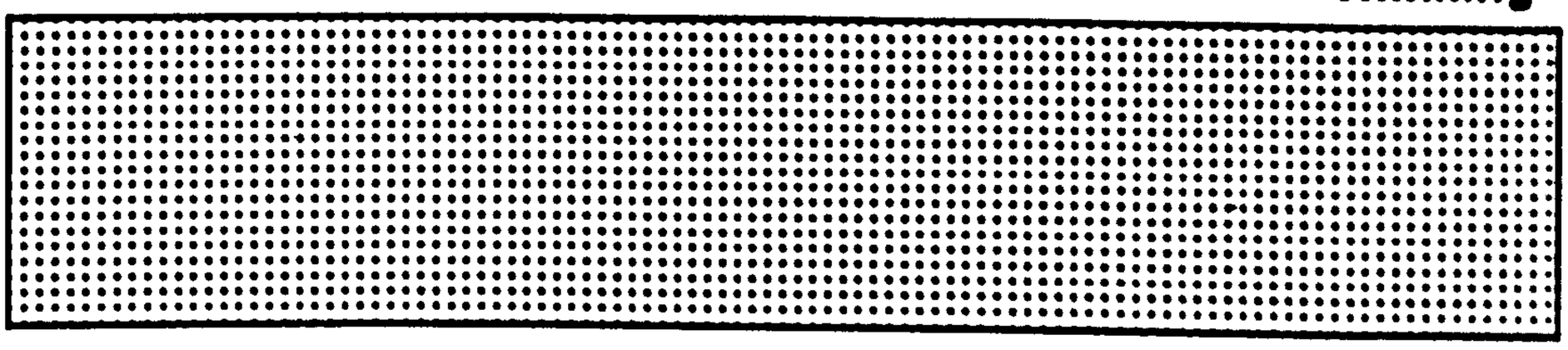
1. **Why did Danny advise the dog to lie quite still?**

Given Thinking Me



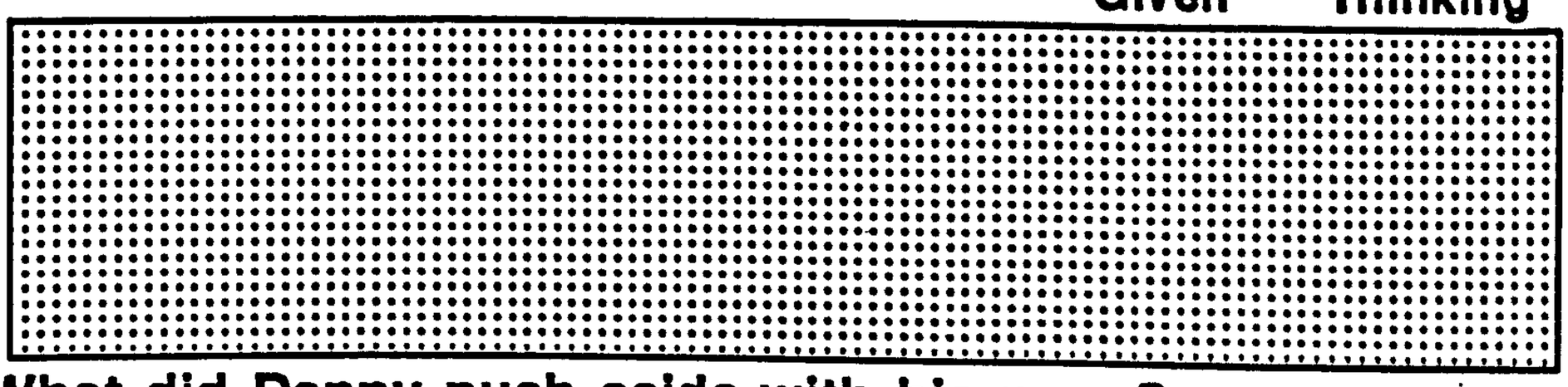
2. **Was Danny really being kind to the dog?**

Given Thinking Me



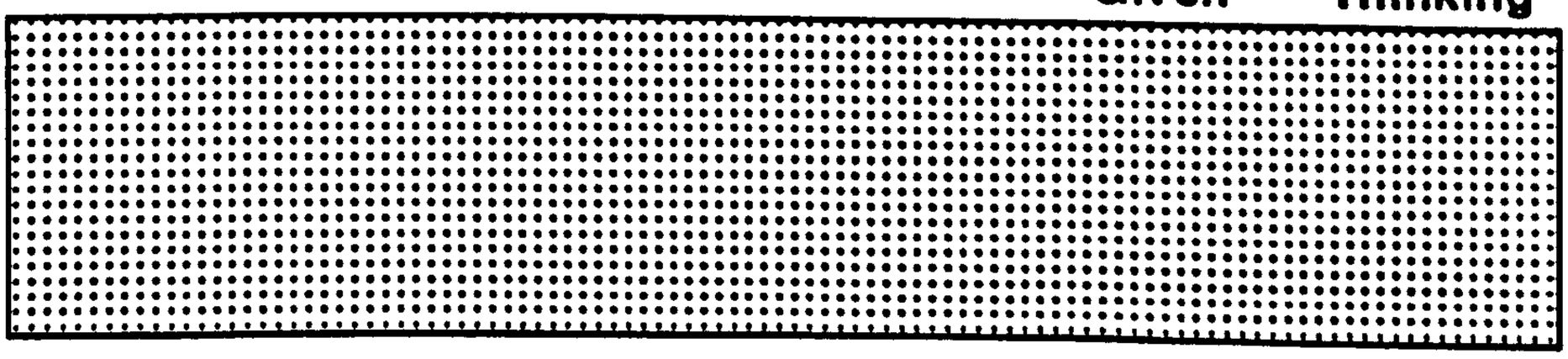
3. **Why was it lucky that the dog's nose was black like Danny's?**

Given Thinking Me



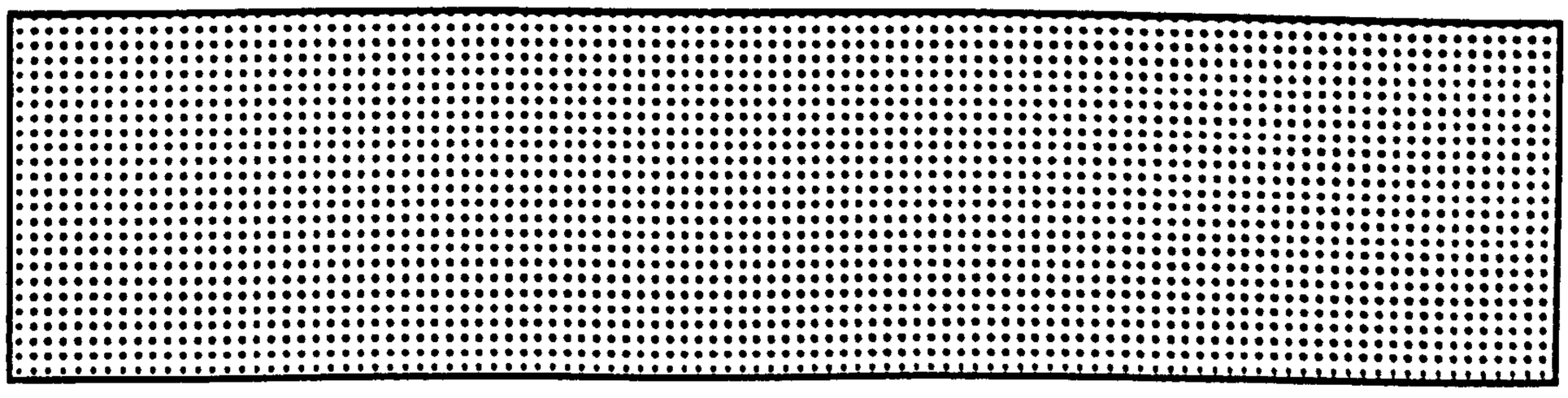
4. **What did Danny push aside with his nose?**

Given Thinking Me



5. **Where do we usually buy fish?**

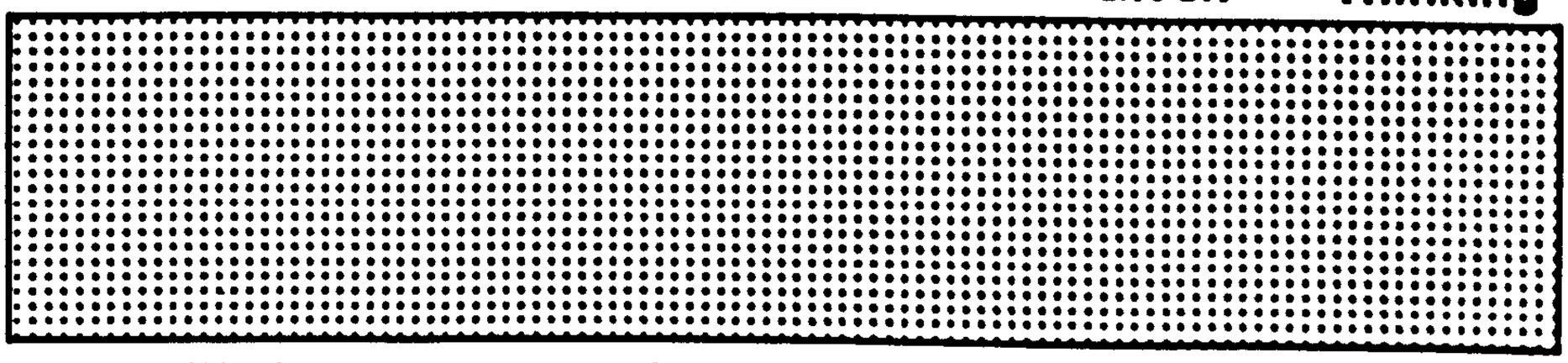
Given Thinking Me



Passage J Exercise 9 Danny Fox Page 87 to 89

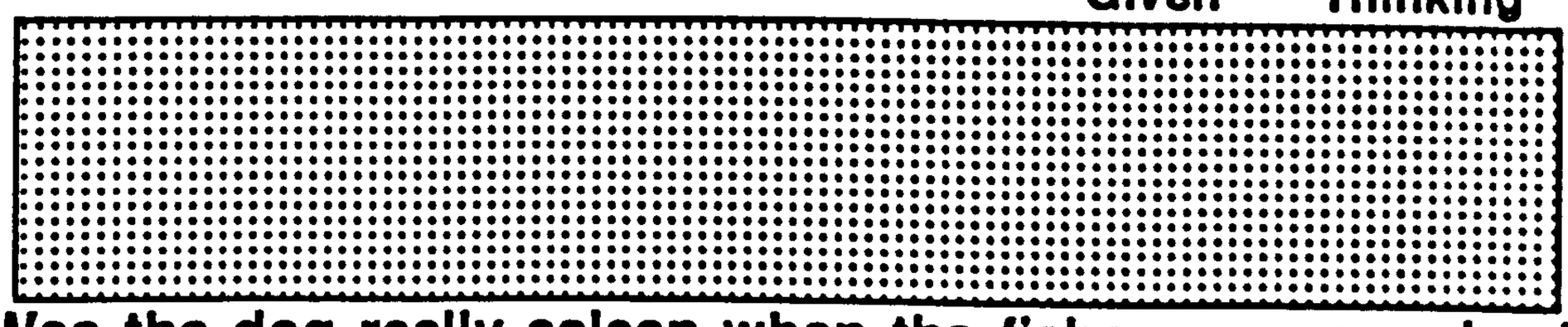
**6. What did Danny do when he saw the fisherman start off for the town?**

Given Thinking Me



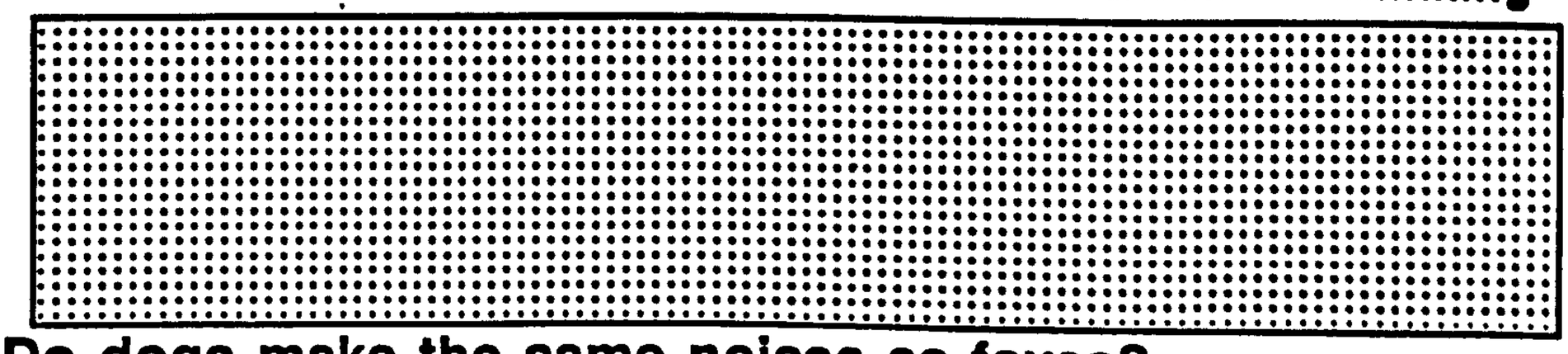
**7. What will the town people do when the fisherman takes the lid off the box to show them the fox?**

Given Thinking Me



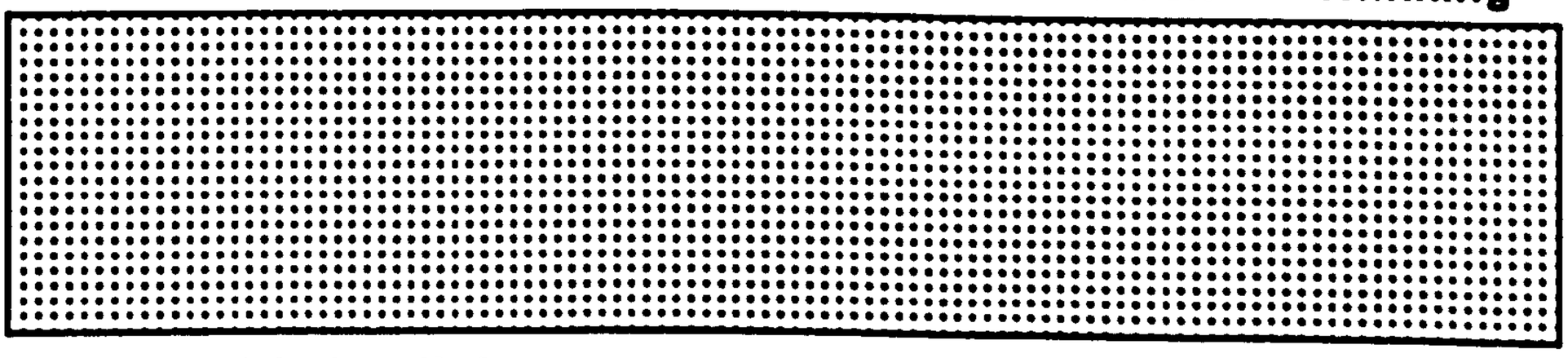
**8. Was the dog really asleep when the fisherman came back from fishing?**

Given Thinking Me



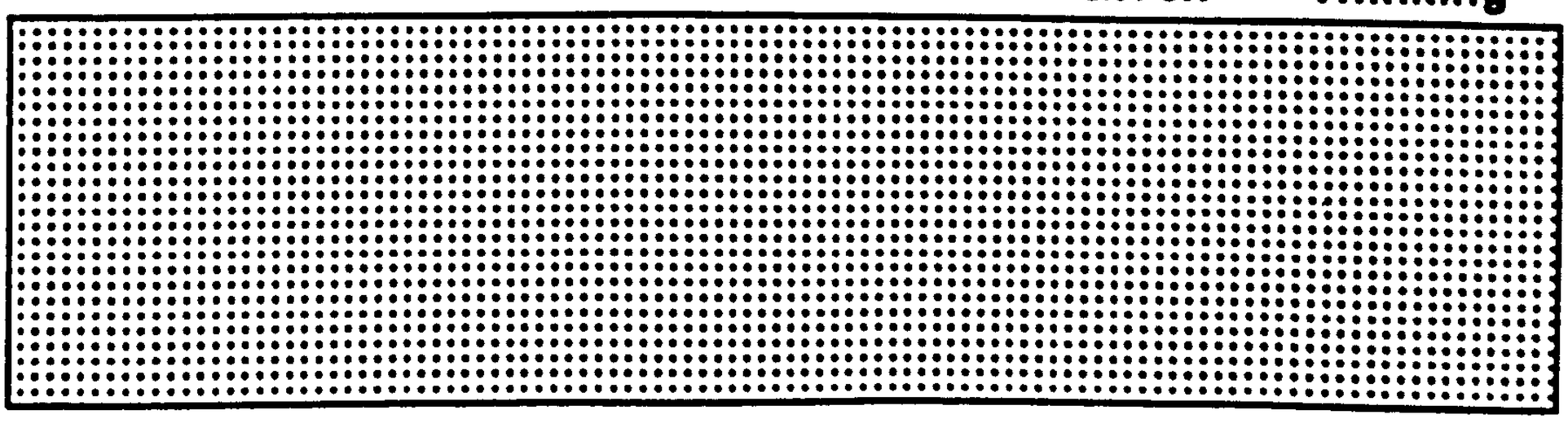
**9. Do dogs make the same noises as foxes?**

Given Thinking Me



**10. When did the fisherman come home from his fishing trip?**

Given Thinking Me



# Exercise 11

1. What did the Princess tie around Danny's chest?

2. Why did the Princess say Danny looked like a prince in a coat of many colours?

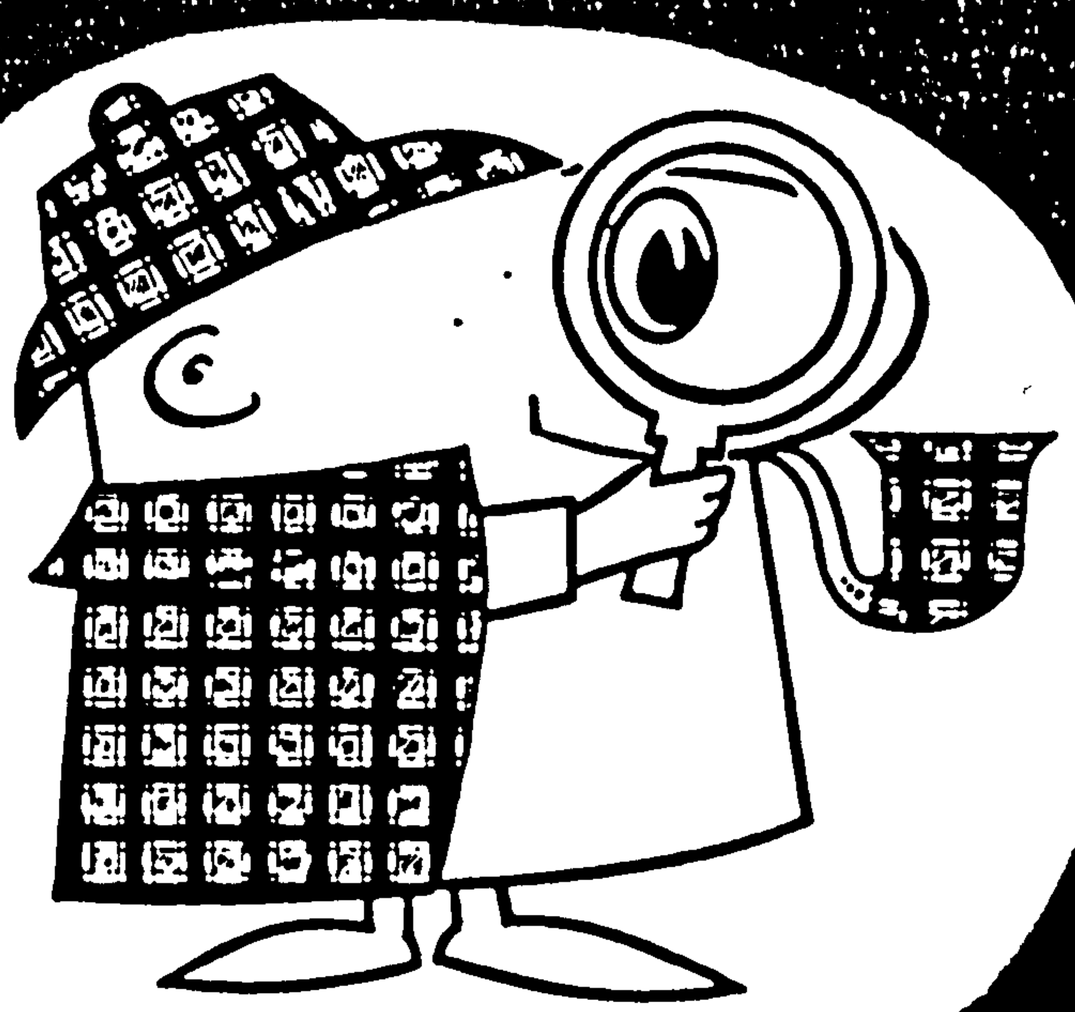
3. Why would Danny's head being too small mean that he would have to wear the crown as a necklace ?

4. What animal produces the material from which we make silk?

5. How was Danny going to show the Princess how strong he was?

# Mr HOMUNCULUS - THE READING DETECTIVE:

## *Children's Workbook*



# Passage A: Danny Fox Steals Some Fish

Danny Fox lived in a small cave on the side of a mountain near the sea. He had a wife called Doxie and three children who were always hungry. Danny and Doxie were often hungry too. The names of their children were Lick, Chew, and Swallow.

Out on the mountain it was very cold, but in the cave it was warm and snug and Danny Fox liked to sleep curled up, with his nose tucked under his hind leg and his long bushy tail round his face like a scarf. Mrs Doxie Fox liked to sleep curled up, with her nose tucked underneath Lick's chin and her front legs hugging Chew and her hind legs hugging Swallow. And Lick, Chew, and Swallow liked to sleep curled up like furry balls against their mother's tummy, while she covered their backs with her long bushy tail like a scarf.

One day the little foxes woke up early and

began to whine and yelp and how.

'Why are you whinning, Lick ?' said Mrs Doxie Fox.

'I'm whining because I have nothing to lick,' said Lick to his mother, Mrs Doxie Fox.

'Why are you yelping, Chew?' said Mrs Doxie Fox.

'I'm yelping because I have nothing to chew,' said Chew to his mother.

'Why are you howling, Swallow?' said Mrs Doxie Fox.

'I'm howling because I have nothing to swallow,' said Swallow.

'Oh please whining and yelping and howling,' said Mrs Doxie Fox, 'and I'll ask your father to fetch some food. Wake up, Danny Fox. It is time to go hunting.'; 'I'm not awake yet,' said Danny Fox, and his voice sounded muffled underneath his bushy tail.

'Then how did you hear what I said?' said Mrs Doxie Fox.

'I heard you in my sleep,' said Danny Fox. 'And now I'm talking in my sleep.' But he opened one eye and they knew he was only pretending. Lick, Chew, and Swallow thought he wasn't going to move, so they began their hullabaloo again.

'Oh please fetch some food,' said Mrs Doxie Fox.

'Lick, Chew, and Swallow need something to lick, chew and swallow, and I need something too.'

Danny Fox sat up and yawned. He stretched out his front legs and yawned and he stretched out his hind legs and yawned. Then he put his nose outside the cave and sniffed the cold air. 'Sniff, sniff I can sniff a rabbit.' He began to run faster and faster up the mountain side, sniffing the ground. Then he saw the rabbit, and yellped and ran faster than ever. But the rabbit escaped by diving into a crack between two rocks. The crack was too narrow

for Danny. He trotted along and he trotted along. Then suddenly he stood quite stood, with his bushy tail stretched out behind him and his long, smooth nose stretched out in front.

## Exercise 1: 'Sniff, sniff, I can smell..'

'Sniff, sniff. I can sniff a pigeon.' He looked and he looked and he saw a wood pigeon just below him on the hill pecking at the ground. He walked very quietly, one step at a time. Then suddenly he sprang at the pigeon. But the pigeon saw him just in time and flew away, and Danny turned head over heels and rolled down the hill. 'Sniff, sniff,' said Danny at the bottom of the hill 'I can sniff a mouse.' But the mouse ran into its hole.

He trotted along and he trotted along till he came to a farm at the foot of the mountain.

' Sniff, sniff. I can sniff a hen.' But the hen saw him and flew up to a branch of a tree. 'Sniff; sniff. I can sniff a duck.' But the duck waddled into the farmer's house, where Danny was afraid to go. 'Sniff, sniff. I can sniff a goose.' But the goose made such a noise that the farmer came out to see what was wrong and

Danny had to hide beneath a bush. I am unlucky this morning,' he said to himself. 'What can I find to take home?'

When the farmer had gone, he sneaked out of the farm yard and began to trot along the road. The road went along by the sea-shore, from the harbour to the town.

'Sniff, sniff. That's funny. I can sniff fish.'

Danny trotted along and he trotted along, feeling very hungry. The smell of fish got stronger and stronger, and the more he smelt it the hungrier he grew. His mouth watered, his pink tongue hung out and saliva dribbled from it on to the road. He sniffed and sniffed and began to run fast. Then he came round a comer and suddenly ped. He saw a horse and cart in front of him. The horse was walking very slowly, the driver seemed to be asleep and the cart was loaded with boxes of fish, all gleaming silver. Danny Fox walked very quietly, one step at a time. Then he ran very

quietly with his bushy tail stretched out behind him and his long smooth nose pointing up towards the cart. When he was near enough he sprang on to the cart and grabbed a fish from one of the open boxes. The driver did not look round. Danny Fox lay down very quietly, hoping not to wake him. His plan was to eat one fish, then pick up as many as he could hold in his mouth and jump on to the cart and run home with them.

## Passage B: Danny Tricks the Fisherman

While Danny and Doxie were picking the fish up from the road, the cart went on towards the town. The driver with the curly black hair was a young fisherman who had been out all night fishing on the sea. When he reached the market square in the middle of the town, he looked up at one of the windows of the tallest building and made a secret sign. The tallest building was the Royal Palace, and from the window, every morning, the Princess waved to him.

Then the fisherman began to shout, 'Come buy my fresh fish. Fresh mackerel and herring! Come buy my fresh fish, caught early in this morning!' and the people came running out of their houses with dishes and pans for the fish and money for him. But when they saw there were no fish on the cart they began to laugh, and other people came running out into the

street to see what they were laughing at until the poor fisherman and his horse and cart were surrounded by a crowd of laughing people. He stood up on the cart and said, 'It isn't right to laugh at me.' But the people said, ' You have no fish. Why did you call to us to buy your fresh fish when you haven't any?' 'I caught a lot of fish last night,' said the man. 'My cart was filled with fish.' But the people said, 'We don't believe you.' Then he told them how he had found a large dead fox and thrown him on to the cart. 'Then where is the dead fox?' the people said. 'Your cart is empty.' 'He must have come alive again and eaten all my fish. This made the people laugh again. Only the Princess waved from her window in the palace to show she believed what he said. The poor young fisherman had to drive all the way home without earning any money. He said

to himself; 'If I see that fox again, I'll catch him. Then I'll take him to the town and show him to the people and make them believe I am telling the truth.' He went home and lit the fire and sat beside it thinking of ways to catch Danny Fox.

## Passage C : Danny is Full

His house was small. It had a front door opening out on to the beach and a back door leading to a stony foot path which went up the mountain towards Danny Fox's den. But which ever door you went in by, you found yourself in the same room, because there was only one room in the house. The back door had a lock at the bottom to allow the fisherman's dog to come in and out. The fisherman's bed was beside the back door against the wall.

He felt lively because he had been out fishing all night, so after he had warmed himself at the fire, he took off his clothes and went to bed. He lay in his bed thinking, 'I wish Danny Fox would walk my house into. Then I'd catch him. If only wishes came true!' And then he felt very lively and fell asleep. He slept until the evening. Eaten Danny Fox had so many fish in the morning that he fell till the evening too

asleep. Then, just as the sun was going down, he went for a walk. He walked and walked till he came to the farm. And the duck and the goose and the hen were watching him.

'Look out,' said the buck, 'there goes Danny Fox.'

'That's funny,' said the goose, 'he has a football'

'That's not a football,' said the hen.

'Yes, it is,' said the goose.

'Yes, it's not,' said the hen.

'What is it, then?' said the duck.

'It is all the fish he has drunk,' said the hen, 'making his tummy bulge.'

Danny walked past the mouse's hole. The mouse was peeping out.

'That's funny,' said the mouse, 'I can see a football rolling along. But it's got legs like a fox.'

But an old mother ewe, who was on the mountain there path, said, 'That's not a

football; that's a fox, and I'm not going to let him come any farther in case he tries to take my lamb away.'

When Danny Fox heard this he walked up to the old mother ewe and said, 'You needn't worry, Mother Ewe. I will take your lamb. I am not a bit hungry. And Doxie's not hungry, because we've got plenty of fish. So please let me pass.'

But the old mother ewe would not believe him. She stood in the of the path middle and lowered her head. She was ready to butt him. Danny Fox could easily have got past her by stepping off the path into the heather. But he felt cross because she would not step to one side and let him pass.

' Get out of my way,' he said. ' Or I'll bite you.'

'Go back the way you came,' she said, 'or I'll butt you and trample on you with my hoofs.'

Danny Fox growled fiercely. The old mother ewe made a rush at him, but he jumped on to

her back and tried to bite her. His teeth sank into her thick wool and did not hurt her a bit, but he would not let go.

'If he holds on like this,' thought the old mother ewe, 'I can carry him away from this place.'

# Exercise 2: Danny Gets Giddy

She started to run down the mountain path towards the beach, with the fox clinging on to her wool. She ran very slowly.

Danny Fox didn't mind. He enjoyed the ride. He said to himself, 'She will soon get tired and then she will have to go back up the mountain to the place where she lives and I won't let go she brings me back till.' But the path led down to the fisherman's house near the bleach, and when they got there the young ewe started baaing for help. The fisherman was still awake and did not hear her.

'Get off my back,' she said. Danny knew if he had spoken he would have to let go, so he did not answer 'If I carry you and outside your den home, will you let go?'

He gave a rug at her wool, which meant 'Yes'.

'Then I'll start running,' she said, 'and I won't till I'm outside your den,'

But of running instead, up the mountain again she ran round and round the fisherman's house. Round and round and ground she ran until Danny Fox began to feel giddy. Round and round and round she ran until the had sun, gone right down and everything was dark. Round and round and round she ran, tin Danny Fox was so giddy he thought he would have to let go. Then suddenly she ped outside the fisherman's back door. Danny Fox was glad to let go. He slid off her back on to the ground. Now he was so giddy that he couldn't stand straight. He wobbled and staggered and, instead of going round and round the fisherman's house, the fisherman's house went round and round him.

# Passage D: Danny Meets the Princess

It was in the middle of the night when Danny got home. Lick, Chew, and Swallow had been sound asleep all the time, but poor Mrs Doxie Fox lay awake worrying because Danny was away so long.

'What have you been doing?' she said when she saw him.

'Nothing much,' said Danny and he gave a big yawn to show he didn't want to talk. He was afraid she might laugh at him if she heard how the old mother ewe had tricked him. He made a yowling kind of noise when he yawned and his white teeth shone in the darkness.

'Well, you haven't been out hunting, I should think,' said Mrs Doxie Fox. 'Not after all that fish.'

'No, I haven't been out hunting,' said Danny Fox and this time he shook himself and sneezed to show he didn't want to talk, and when he shook

himself a cloud of ashes from the fisherman's fireplace flew out of his coat and made Mrs Doxie Fox sneeze too. He sneezed and she sneezed and she sneezed and he sneezed and they both sneezed together and made such a noise that the children woke up, and Lick and Chew sneezed and Swallow sneezed too. And then Mr. Danny Fox and Mrs Doxie Fox and Lick, Chew, and Swallow all sneezed together, and made such a loud noise that all the animals and birds who stay awake at night - such as the mouse and the rat and the owl and the cat, and the nightjar and the bat, and the polecat, the nightingale and mole, and water-vole, and the weasel and the hedgehog, and the badger and the bullfrog - left whatever they were doing and came to the door of the foxes' den to listen. And this is what they heard:

'I can smell burning!' (It was Lick who said that.)

'It's someone's fur burning!' (It was Chew who said that.)

'It's Daddy. It's Daddy. Oh Mummy, he's on fire!'

It was Swallow who said that in his high yelping voice. 'He's not on fire, said Mrs. Doxie Fox. 'But, Danny I'm afraid you've singed your beautiful red coat, and, oh, you are covered with ashy dust. A-tishoo!'

'If I've singed my red coat, said Danny Fox, 'it is because I'm the bravest and cleverest creature in the world.'

'Oh yes! You are brave and clever,' said the children. 'Oh tell us what you have done.'

So he told them how he had escaped from the fisherman's house.

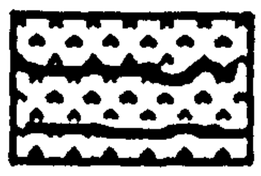
'I think you are too brave and clever,' said Mrs Doxie Fox. 'If you think you are so brave and clever, one day you'll be caught.'

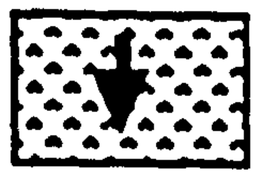
When the animals and birds who were crouching at the door heard her say that, they laughed loudly. And when Danny Fox heard

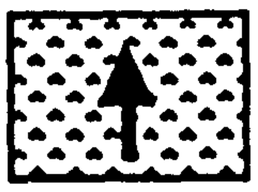
them he rushed out barking and snarling and curling up his lip to show his fierce white teeth. Those who could run ran away and those who could hop hopped away, and those who could fly flew away. No one was brave enough to laugh while Danny Fox was near. And Danny walked back into his den, very stiffly and proudly with the hair of his neck and back standing up on end.

# Exercise 3: Danny Meets The Princess

Danny Fox was the first to wake up in the morning. Just as the sun began to rise he walked down the mountain path, sniffing the morning air and standing still every now and then on three legs,  with one front paw dangling, to look into the distance. He saw the fisherman's cottage below him and beyond it the sea, which was pale blue grey, with a long bright streak across it, like a golden river.  The golden river was really the sunlight reflected on the water as on a mirror. The sun had just come up on the horizon. Only half of it showed above the water, like half a plate made of gold. In the middle of the sea, a long, long way away Danny Fox saw a dark blue blob sticking up out of the water. He did not know what it was. Whenever he went for a walk he

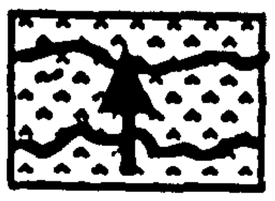
looked at everything, the near things and the far things, and if he didn't know what something was, he felt secretly frightened. But he never told anyone that. If the thing moved he was very frightened. If it didn't move he was only a little bit frightened. 

The dark blue thing sticking out of the sea did not move at all because it was an island. But Danny Fox was a little bit frightened because he didn't know what an island was. 

Then he heard a noise quite near him, and smelled a smell he had never smelt before, and saw a strange thing bobbing up and down behind a rock. The noise was made by the Princess. She had knelt down behind the rock to watch him and by mistake her knee had touched a dry twig which broke with a crack. 

The smell was the smell of a precious scent called *Crepe de Chine* which she dabbed behind her ears every morning. And the strange thing which Danny Fox saw bobbing up and down

behind the rock was the crown she wore on her head. The Princess had never been so near a wild fox before and she was trying to hide from him and to watch him at the same time.

She thought him beautiful. 

# Exercise 4: Danny Flies Away

The whole of the sun had risen above the sea by now, but it was not yet high in the sky, and the shadows it cast on the mountain side were very long. Even a small stone had a shadow ten times as big as itself and Danny Fox, when he looked at his own shadow, was prouder of himself than ever, because his legs seemed longer than a wolf's, the shadows of his teeth were like long daggers, and his ears looked big and frightening like sharp horns. But suddenly the whole lovely, big, fierce shadow of Danny Fox was blotted out by a really terrible shadow that came down from something in the sky. Danny Fox crouched with his tummy to the ground and crept into a big clump of whins. He sniffed and he sniffed and he lay down on the prickly ground beneath the whinbush and rested his chin on the back of his front paws, and he sniffed. He peered and

peered out from a gap between the yellow flowers of the whin and he saw the shadow of a bird with two gigantic wings.

'Sniff, sniff,' said Danny in the whinbush, and the prickles were prickling his tummy. ' Sniff, sniff. I can sniff an eagle, and even if the shadow of that eagle is ten times as big as the eagle, I'm going to hide here till he's gone.'

The King Eagle, the golden eagle, whose wings if he stretched them out from tip to tip would reach from the pillow to the foot of a grown-up person's bed, had seen Danny Fox and decided to give him a fright. He knew, and Danny knew, that the golden eagle is the only bird strong enough and brave enough to pounce down from the sky on a fox and pick him up in his claws and fly away with him. But the King Eagle didn't want to do that. He only hovered over Danny Fox for fun . . . to see what Danny would do when he was frightened.

# Passage E: Danny Is Marooned

Danny Fox was hungry. He hadn't had his usual Eagle's egg. In fact, he hadn't had any bread at all, and on the little island he couldn't smell anything except grey rock and he couldn't smell anything that smelt like food. When he put his nose in the air to sniff for food the wind was so strong that he could hardly breathe. He turned his back to the wind and sniffed towards the middle of the island.

'Sniff, sniff,' he said, 'I can only sniff fresh air.' Then he turned his left side to the wind and the wind ruffled his red coat, showing a yellow furry lining underneath, and he sniffed towards the beach.

'Sniff, sniff,' he said, 'I can only sniff seaweed.' Then he turned his right side to the wind and the wind ruffled the other side of his red coat, showing another bit of yellow furry lining, and

he sniffed towards the other part of the beach.

'Sniff, sniff,' he said, 'I can only sniff seaweed there too.'

'Don't you like the smell of seaweed?' said a voice.

'Only after breakfast,' Danny Fox said. He put his head on one side to listen. Then he looked all about him and turned round and round, but he couldn't see anyone at all. He couldn't smell anyone either.

'Who's there?' he said. 'Sniff, sniff. I can only sniff fresh air.'

'Don't you like fresh air?' said the voice.

'After meals it's all right,' said Danny Fox. 'But if you have too much of it, it makes you hungry.'

'Why don't you shut your nostrils then, until you've caught a fish?'

'Shut my nostrils?' said Danny. 'I can keep my mouth shut sometimes, but not my nostrils.'

'You can't be much of an animal,' said the voice

'And you're not much,' said Danny Fox, 'because I can't even see you. And I can't smell you. You are nothing.'

'Can't you open your eyes?'

' Of course I can open my eyes.'

'And shut them?'

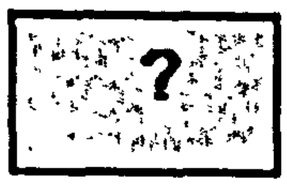
'Of course I can.'

'But not your nostrils? You can't open and shut your nostrils!' said the voice and laughed at him.

## Exercise 5: Danny is Marooned Continued

'But not your nostrils? You can't open and shut your nostrils!' said the voice and laughed at him. 'Of course not,' said Danny Fox crossly. 'Nobody can.'

'Sea animals can,' said the voice. 'Just open your eyes and look down, at the water.'

Danny Fox heard a noise of someone blowing bubbles under water. Then he trotted down over the rocks to the edge of the sea, with his long smooth nose stretched out in front of him and his bushy tail stretched out behind, and he saw a round head which seemed to be floating on the sea, with two brown eyes that gazed at him and a wide whiskery mouth. 

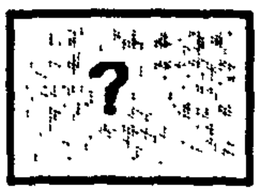
'Sniff, sniff,' said Danny Fox. 'I can smell fish.'

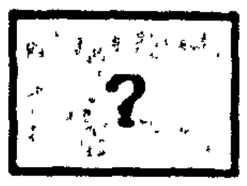
'No, you can't,' said the whiskery mouth in the sea, 'you can probably sniff me, because I eat so many fish. I am a seal, a *Phoca barbata*.'

'I beg your pardon,' said Danny. He was always

very keen to learn words he'd never heard before. He liked to go home and use the new words when he spoke to Lick, Chew, and Swallow. He liked to hear them say, 'What does that mean?' and then he would tell them the meaning.

'What does that mean?' he said to the whiskery head.

'A *Phoca barbata* is a seal – a bearded seal, one of the largest of all the seals – and one of the fattest. You'd better remember that, because if you're going to live on this island you may need me.' 

'Did I hear you mention catching fish?' said Danny Fox. He put on the sweetest voice he could imagine. He was trying to talk like the Princess. But the seal said, 'Why are you talking in that funny way. Watch my nose.' 

# Passage F: Danny's Bridge Across the Sea

'Now,' said the seal. 'You think there are more kinds of animals on the land than in the sea. Don't you?'

'Yes,' said Danny Fox with his mouth full

'Well,' said the seal. 'When you've finished eating, look over there.'

Danny Fox finished eating and looked up and saw a mighty commotion in the sea. One minute it was full of bobbing heads and splashing bodies like a crowded swimming pool, and the next minute it was bubbling and squirting and gushing and swashing like a washing machine full of different coloured clothes. The highest squirts came from the whales who blew tall fountains of water into the air and the longest line of splashes came from the dolphins who jumped in and out of the

water as they raced along. And all the other animals that lived in the sea were playing and gurgling or fighting and squalling or bubbling and slushing and squishing and squashing, or fishing and guzzling or pushing and nuzzling or cuddling or muddling and paddling and puddling along.

Danny Fox couldn't tell whether he was watching a million animals all jumbled up, or one immense animal that kept on falling to bits and joining together again.

'Well, count them,' said the seal.

'How can I count that muddle' said Danny Fox.

'Line them up and tell them to keep still. The seal began to line them up round the shore of the island with their noses to the beach. But he told the whales not to come too near.

'If they run aground in shallow water we shall never get them off again,' he said to Danny Fox.

'I quite agree, Mr. Phoca Barbata,' said Danny.

'In fact I think it is dangerous for any of these animals to come near the shore.'

'The seals don't mind,' said the seal. 'We can walk on the land quite well.'

'How many kinds of seals have you brought?' said Danny Fox.

'I've brought the common seal, and the fur seal and the hair seal and the harp seal and the golden seal.'

'Tell the common seal to put his front feet on the beach,' said Danny Fox. 'The fur seal and the hair seal and the harp seal and the golden seal can line up behind him in the sea. Then some other animals can go behind them until the line reaches water deep enough for whales.'

'And I've brought the marbled seal, the monk seal, the Atlantic grey seal and the elephant seal and the bottle nosed seal,' said the seal.

'The bottle-nosed seal?' said Danny Fox, with his head on one side.

'And the sea leopard - and that's all the seals I've brought.'

'The sea leopard? What's that?' said Danny Fox.

'It's another name for the South Sea seal' said the seal 'You've heard of the sea lion, I suppose?'

' Of course,' said Danny Fox.

'Nearly all sea animals have two names,' said the seal. 'And one of those names comes from a land animal.'

'Tell the sea leopard to swim to that land over there where my home is and put his front paws on the beach,' said Danny Fox, 'and the marble and monk and elephant and grey and bottle-nose can line up behind him. Then if all the others can bridge the gap between those two lots of seals I'll admit there are more animals in the sea than on the land.'

## Passage G: The Fisherman Tricks Danny

Danny Fox was so hungry and tired after his long walk over the bridge of animals that he did not notice that he had landed on the beach just below the fisherman's house. He did not notice the fisherman's boat on the sands, nor his cart which was beside the house. And he walked very slowly up the beach, trying to think of a plan to get something to eat. The seal shouted after him, 'Now bring an the land animals here for me to count.'

'Oh, go away,' said Danny Fox.

The fisherman was sound asleep inside his home. He had been out fishing most of the night but had not caught any fish because the seals and dolphins and porpoises had chased them all away. And when the whales arrived in the early morning, he had started up his engine in a hurry and rushed home, afraid that they might upset his boat. So instead of

driving to town to sell fish as usual, he had gone to the mill with his horse and cart to fetch some crushed oats. And when he came home from the mill and unloaded the sacks from the cart, he had spilt some of the oats on to the ground outside his door. Then he had gone to bed.

The fisherman had a cock and two hens. When the cock saw the oats on the ground he went 'cluck, cluck, cluck' to call the hens to the feast. He made such a loud noise that the duck and the goose and the hen who lived on the farm heard him too, and they all came running down to the fisherman's house to see what they could find to eat. And there they all were, picking up oats in a greedy hurry, when Danny Fox arrived.

# Passage H: Danny is Tricked

'Look out,' said the duck. 'There goes Danny Fox.'

That's funny,' said the goose. 'He has swallowed a safety pin, and it's pinned the two sides of his tummy together and made him look thin.'

'That's not a safety pin,' said the hen.

'Yes, it is,' said the goose.

'No, it's not,' said the hen.

'What is it, then?' said the duck.

'It's just thinness,' said the hen. 'He's had nothing to eat for days and days and days, except one small fish for breakfast this morning.'

'How do you know?' said the duck.

' She doesn't,' said the goose.

'Yes, I do said the hen.

'No, you don't,' said the goose.

'Yes, I do,' said the hen. 'The sea robin told me this morning.'

And the fisherman's cock, who had said nothing this time, suddenly shouted, 'Run away! Quick And arguing.'

The fisherman's cock had seen Danny Fox just in time. Danny Fox had heard their voices and stood still. Then he had started stalking them, coming towards them very slowly, with his skinny nose stretched out in front and his poor threadbare tail stretched out behind him.

And now the goose and the duck and the hens all ran away cackling and squawking, and the fisherman's cock flew up and perched on the side of the cart.

# Exercise 8: The Fox in a Box

Danny Fox said to the fisherman, 'I hope you're not going to show me like this to the Princess and the people of the town?'

'Like what?' the fisherman said.

'When you first found me,' Danny Fox said, 'you spoke about my beautiful red coat and my beautiful thick red trousers. What will the townspeople think if they see me like this? I'm so worn and thin.'

'Yes, you look a bit rotten and mangy,' the fisherman said.

'And look at my beautiful long bushy tail. Half the hairs have fallen out!'

'Yes, it looks like an old toothbrush that someone has thrown away,' the fisherman said.

'Well, you can't let the Princess see me like this. You must give me lots to eat and let me run about, till I grow fat and glossy again.'

'I'll feed you,' said the fisherman, 'but I won't

let you run about or you'll escape.'

But he hadn't caught any fish for two nights and he was so poor that all he could find to give to Danny were some old potato peelings and a hard stale crust.

When night time came the fisherman went out in his boat. 'Tomorrow, I'll take you to town with my horse and cart,' he said to Danny Fox. He left the dog on guard. 'You watch Danny Fox doesn't bite his way out through the bars,' he said to his dog.

As soon as Danny Fox heard the engine of the motor boat fading away out to sea he began to bark and howl inside the tub.

'Be quiet,' said the dog. 'What's the matter with you?'

'I'm hungry,' Danny Fox said.

'So am I,' said the dog. 'I only had potato skins and a crust of bread for dinner. But I'm not making a fuss.'

'A crust of bread!' said Danny Fox. 'That's

funny. Your master gave me a huge big meal'

'He didn't!' said the dog.

'Yes, he did,' said Danny Fox.

'No, he didn't,' said the dog.

'Yes, he did,' said Danny Fox.

'No, he didn't,' said the dog.

'Yes, he did,' said Danny Fox. 'He gave me a whole chicken all to myself, and a big piece of salmon, and a hunk of cheese as thick as your head.'

# Exercise 9: The Escape

The dog felt hungrier and hungrier as he listened to Danny Fox.

'How would I get into the tub?' he said

'Can't you pull out the nails with your teeth?' said Danny Fox. 'And loosen a couple of bars?'

The dog pulled at the nails and they came out easily. Danny Fox pushed the bars aside with his nose and jumped out.

'Now in you get,' he said to the dog, and the dog jumped into the tub.

'Luckily the tip of your nose is black like mine,' said Danny Fox. 'If you lie down till your breakfast comes the fisherman will think you are me.'

'Oh thank you,' said the dog. 'You are kind.'

Danny Fox pushed the bars back into position. He tried to nail them down again, but of course he couldn't.

'Remember to lie quite still,' he said to the

dog. 'Don't move or make a noise, what ever happens.' Danny Fox ran away and left him there.

The fisherman came home in the early morning, just as it was beginning to get light. But inside his house it was still rather dark. He could not see very much. But he did notice that two of the bars had come loose. He peered into the tub to make sure that the fox was still there, and when he saw a black nose in the shadowy darkness, he said to himself, 'That's all right, he's asleep.' Then he fetched his hammer and made the bars firm again. Then he covered the tub with a sack and carried it out to his cart.

He loaded the cart with boxes of fish And he took a large, old fishing net with him as well.

He had caught plenty of fish that night and he set out for the town, happily thinking, 'First I'll sell my fish. And then I'll take the sack off the tub and let the people see what a big fox

I've caught.'

Danny Fox had been hiding outside the back door all this time, waiting to see what would happen. When he saw the fisherman start off for the town, he ran by a short cut across the fields, as fast as he could go. The horse and cart was slow and Danny Fox was quick and Danny Fox arrived at the market place in the middle of the town in the early morning before any of the people were awake. He was looking for a good place to hide in and watch what would happen when the fisherman discovered the dog in the tub.

Suddenly he heard a voice that seemed to come from the sky.

It was the Princess calling to him from her bedroom window in the Palace.

'Good morning, Mr. Fox,' she said.

Danny looked up and saw her with her elbows on the window sill, watching him.

# Exercise 10: Passage K- Danny Helps the Princess

The fisherman called to the Princess. 'May I come into your palace and catch the fox again?' he said.

But the Princess made signs to show it was too dangerous. She thought the Queen might find him in the palace and lock him up in prison.

'I'll try to catch him for you,' she said. 'I think he is in the cupboard, or under the bed.'

Then she heard Danny Fox whimpering under the bed. Then she saw his nose sticking out.

'Yes, there he is,' she said, 'I'll throw him out of the window. He won't hurt himself if you catch him in the net.'

'Please don't throw me out,' said Danny Fox.

'Why not? You tricked him, didn't you?' the Princess said.

Then Danny Fox came up to her and licked her

hand. He told her how he had tempted the dog and made him get into the tub. The Princess wanted to be cross with him but she could not herself laughing.

'I am clever, aren't I?' Danny Fox said.

The Princess tried not to laugh.

'If you let me go, and don't throw me down,' said Danny Fox, 'I'll make your best wish come true.'

' What do you mean?' the Princess said.

'What would you like best in all the world?' said Danny Fox.

'That's a secret,' the Princess said.

'If you tell me the secret, I can make it come true,' said Danny Fox.

The Princess knelt on the floor beside him and whispered in his ear.

'I want to marry the fisherman,' she said. And then she sneezed because Danny Fox's furry ear tickled her nose.

'That's simple,' said Danny Fox. 'I'll fix it up for

you.'

'You couldn't do that,' the Princess said. 'My step mother, the Queen, won't allow it.'

'Is your stepmother clever at tricks?' said Danny Fox.

'No, she's stupid and horrid,' the Princess said.

'She wants me to marry a very rich man.'

'Why doesn't she like the fisherman?' said Danny Fox.

'Because he is poor,' said the Princess.

'Then I know how to make her like him,' said Danny Fox.

'How?' said the Princess.

# Passage J: Danny Fox Goes Home

The Princess came with Danny Fox to the door of the Palace, to say 'Good-bye'. She opened a chest beside the front door and began to sort out a pile of sacks made of fine silk in every colour of the rainbow. She filled five silken sacks with food for him to take home - a red sack of food for Danny, a yellow one for Mrs Doxie Fox, a green one for Lick, a blue one for Chew, and a violet one for Swallow. Then she filled five other sacks with sumptuous wedding cake, with white icing and pink icing, and 'hundreds and thousands' of every bright colour one sackful for Lick, one for Chew, one for Swallow, one for Mrs Doxie Fox, and one for Danny.

'How on earth will you carry them all?' the Princess said to Danny.

'I'll take the biggest one in my mouth,' said Danny Fox. 'Please tie the others on to me.'

# Exercise 11

So the Princess tied three silken sacks round his chest, a red one on his back and yellow ones against his ribs on each side. And she tied three then round his middle - another red one on his back, and two ween ones against his tummy. And then she tied three to his tail - a blue one at the top, a violet one on its bushy middle part and another blue one at its beautiful white tip.

'And now,' said the Princess, 'you like a prince look in a coat of many colours, but I think that's too big a load for you to carry up the mountain.'

'I've shown you how stupid I am,' said Danny Fox. 'And now I can show you how strong I am.'

'All right,' said the Princess. 'But wait a minute. I haven't given you your special present yet.'

'What can that be?' said Danny Fox. He couldn't wag his tail because the silken sacks were too heavy.

The Princess went away and came back holding her crown.

'This is for you,' she said, and put it over his head. 'You'll have to wear it like a necklace, as before, because your head is too small.'

Danny Fox was terribly pleased. 'Do I REALLY look like a Prince?' she said. And the Princess bent town and kissed his furry red forehead.

# Appendix 4a

## Test materials for Question Generating Measure - Main Study

# Question Generating Passages : Main Study

The fearful roaring of the dragon guided the Knight to the monster's territory. As the intruder crossed the dreaded marshes, the dragon charged furiously, whipping its enormous tail around the legs of the Knight's steed. Horse and rider collapsed.

The Knight now realised that he must attack when the creature was off-guard. He crouched as though wounded. The monster, accustomed to speedy victory, prepared to seize its prey. Then the Knight struck powerfully beneath the beast's outstretched wing. A despairing groan told the villagers that they would be troubled no more.

**The Knight's Story: pre-test: Above average readers**

Dark clouds blotted out the fading daylight. A mournful wailing filtered through the deserted building. The children stopped exploring.

'Ghosts!' whispered one child. 'Nonsense!' replied the other. Nevertheless, they proceeded cautiously in the direction of the mysterious noise.

Gathering courage, and with mounting curiosity, they approached the old kitchen door. Scarcely daring to breathe, they released the catch. Their torches searched the darkness. Immediately their anxiety turned to pity. An exhausted dog lay crouched and whimpering. A gust of wind had slammed the door shut while the dog had been hunting for rats.

# Question Generating Passages : Main Study

The lions' final act was in progress.
Jack stood waiting to clear the ring.
The thunder outside the circus tent had made
the lions restless. Suddenly Tina, the
lion trainer, stumbled. Her whip fell.
The youngest lion sprang towards her.

Jack leaped swiftly inside the cage,
cracking the whip with great skill. His
prompt action enabled Tina to regain control
quickly. After that brief adventure, Jack
decided upon his future work.

**The Lion's Final Act: pre-test: Below average readers**

It was dusk. Many people had gathered to watch a strange sight. For a while, there was no sign of life on the sand-hills or on the beach.

Then a soft murmur arose from the crowd. Floodlights swept the beach as a line of penguins, bulging with fish for their chicks, came waddling from the surf.

They staggered up the sand-hills along well-worn paths to their burrows. Their chicks thrust their heads out impatiently, and suddenly the wonderful parade had ended.

# Appendix 4b

## Test materials for Comprehension Measure - Main Study

# High Life

Mike was thrilled when the family moved to the tenth floor of a high-rise block of flats. He could see the play-area far below, and beyond that the streets of the city like a gigantic spider's web. On the third day after their move he noticed a small black shape outside the window. It was rectangular, a metallic box with two steely feelers standing out like antlers. It rotated ceaselessly on its axis, poised always within his range of vision.

'What is it, Dad? It's making a sort of humming noise.' The high-pitched squeaks came in a series of long and short notes, rather like Morse Code.

'Can't see anything, lad,' Dad said, peering out short-sightedly. 'Where are my glasses?' Even with his glasses on he could not see or hear anything. Mum came over: 'There's nothing there – talk about having your head in the clouds!'

Pat, Mike's sister, wandered in, half asleep. She had the sharpest eyes of all, but she swore she could see nothing but 'mucky old sky, and boring old clouds!'

Mike was sure that, if he listened intently, he would get the message. The black shape mesmerised him with its slow-motion rhythm.

It came to him gradually. The first word he recognised – how he did not know – as 'COME.' It began a little phrase of bleeps, repeated endlessly. 'COME – bleep – bleep – bleep – *bleep*,' it went, like the song of a rusty mechanical bird. Next came the final words: 'TO ME.' So the phrase seemed to mean: *'COME – bleep – bleep – TO ME.'*

Suddenly the box whirled round much faster. The phrase was repeated more urgently. He understood it all. 'COME – FLY – UP – TO – ME' went the supersonic bleeps, over and over again, piercing his ear-drums.

Mike opened the window and climbed out, standing framed in the space, holding on to the curtains for balance. He would fly . . .

'Mike! Whatever are you doing? Get down at once! Pat, Pat, come quickly!' Arms grabbed him and pulled him back into the room. He landed uncomfortably on the floor, with Mum's red, anxious face glowering above him. He clambered up, bruised and panting. He looked out of the window. The box had disappeared. His head was empty of rhythms and messages. He felt sad; it was as if he had let someone down badly, but already he was forgetting who or what.

The local paper carried a small headline that evening: 'An unidentified flying object was to be seen over the Blackwater flats this morning. It appeared to crash to earth at approximately eight a.m.'

**The High Life: pre-test: Above average readers**

# The High Life

1. What was the name of the boy in the story?

2. What did Mike notice on the third day after the family's move of house?

3. Who wandered in half asleep?

4. What did Mike's sister say she saw?

5. What did the supersonic bleeps say?

6. What did Mike's Mum think of his claims at seeing a strange object and hearing funny noises?

7. What would have happened if Mike had been on his own that night?

8. How do you think Mike's mum and dad felt when they pulled him down from the window?

9. Why did nobody else in the family see the strange object?

10. Was Mike dreaming? (Why)

**Pre-test: Above average readers**

# Whatever happened to Jack?

The sun was blazing hot as Jack dived into the water from a high rock. He was a good swimmer, and Liz found that she could not keep up with him. She swam as quickly as she could across the bay to reach him. Suddenly she realised that she couldn't see him any longer. He couldn't have got out of sight so quickly! There were some bubbles on the water. Liz thought he must have dived under the water to tease her, and felt very upset and cross. Then a little head appeared where the bubbles were; it was green and slimy with big pop-out eyes. It made a strange gulping sound and then spoke. The voice sounded just like Jack's, but the words were different from any that she had ever heard before.

'Glomp, swolk, bub, bub, glomp,' said the head with Jack's voice. Liz didn't know what to do. She was half frightened and half angry.

'Don't tease me, Jack,' she said. 'Come up from under the water.' But his voice really was coming from the strange animal's mouth. She put out her hand to touch it, but it had gone under the water again, with just the bubbles left to show that something was breathing.

Liz started to swim back to the rock, swallowing water because she was frightened and couldn't breathe properly. She pulled herself up on to the dry grass at the top of the rock. Jack was there already! He, too, looked very frightened.

'What happened? Where were you?' panted Liz.

'When I got out there I felt something pulling at my leg. It pulled me right down into the water. It was all dark, and there was a rushing in my ears. But I could breathe quite well. It was funny. I began to feel like someone else. I couldn't remember who I was. I seemed to get smaller, and my skin felt all loose. I felt I wanted to swim around there for ever. I even felt like catching a little fish in my mouth and eating it. It was good fun; for a time my arms felt like flippers, and I thought I'd stay there.'

'What happened then?' asked Liz, trying to believe that he was making it all up.

'I heard your voice calling me. It was very far away, but I heard it. I thought you sounded frightened, so I swam under water to the rock, because I thought you would be there. When I climbed out I saw you swimming towards me, and I knew that I was myself again.'

Liz and Jack gazed across the bay, but it was as smooth and clear as glass. Neither of them could think of any explanation. They smiled at each other, packed their gear, and trudged back to the house.

# What Ever Happened to Jack?

1. What were the names of the children in the story?

2. Where did the little head appear?

3. What did the head with Jack's voice say?

4. What did Jack's arms feel like?

5. Where did the children trudge back to?

6. What time of day were the children swimming in the water?

7. Why was Liz frightened?

8. How do you think Liz felt when she swam back to the rock and Jack was already there (WHY)?

9. Why did Jack feel like catching a little fish in his mouth?

10. What do you think Jack had turned into?

## What Ever Happened to Jack: Post-test: above average readers

# The House in the Wood

It was dark in the wood. Richard and Ruth tried to keep cheerful, but their picnic basket seemed very heavy. Champ, their terrier, was happy, though. He liked all the scents, and kept rushing backwards and forwards making excited little yelps.

'Wait a minute. I want a rest,' panted Ruth. They put the basket down and sat down on an old tree stump.

'Are you all right?' Richard said, after a minute or two. 'We'd better get going. Champ, where are you?'

Champ had disappeared. The two children hunted everywhere. Then they found a hole under the tree-trunk, and in the mud they could see fresh paw-marks. Champ must have gone down the hole. There was no sign of him now.

'We'll walk on a bit. He is sure to come after us. We will go on calling him.' Ruth picked up the picnic basket and started walking.

They seemed to go on for hours, calling all the time. Ruth started to cry. Just then they came to an open space in the wood. In the clearing was a little house. The windows were covered with cobwebs and were tightly shut. The door was locked with a rusty old padlock. Leaves covered the roof and hung down over the windows. Nobody could have been near it for years. There were no footmarks in the mud round the door.

The children sat down and opened their picnic basket. The food made them feel a little better.

'What's that noise?' said Richard. They could hear whining, and then a soft bark. The barking was coming from inside the house! They could find no way in. Everything was still locked. But the barking was coming from inside, they were sure.

'We shall have to break in,' decided Ruth. Richard found a big stone, and broke one of the little windows. The hole was just big enough for a dog to jump through. A minute later Champ charged through the hole. He landed, panting and whimpering, on top of the picnic basket. He stayed very close to the children all the way home.

'Perhaps there was a secret passage from the hole to the house?'

They would never know. Only Champ knew, and he wasn't telling.

## The House in the Woods: Pre-test: Below average readers

# The House in the Woods

1. What were the names of the children?
2. What could the children see in the mud?
3. What were the windows of the house covered in?
4. Where was the barking coming from?
5. Who charged through the hole?
6. Why did Richard say to Ruth after a minute or two: "We'd better get going"?
7. What time of day were the children in the wood?
8. Why did Ruth start crying?
9. Why did the children think that there had been nobody near the house for years?
10. Why did Champ stay very close to the children all the way home?

**The House in the Woods: Pre-test: Below average**

It was winter. Snow lay thick on all the houses, trees and bushes. Linda and John had never seen so much snow. They couldn't wait to go out and play in it. They rushed through their breakfast, talking about their plans for the day. They had a sledge made out of a tea-tray, which they decided to save for the afternoon. They would spend the morning snowballing in the garden, and building a snowman. They put on their warmest jumpers and their fur-lined boots and hurried outside.

The snow was just right for making snowballs. They had to take their gloves off to roll them. Then their fingers got so icy that they tingled. Soon they were throwing snowballs at each other from the piles they had made. Linda was hit in the eye, but she only laughed. The snow was soft enough not to hurt. The children threw snowballs at the dog, the lady next door, and the milkman. Nobody seemed to mind. Then, tired, they looked around for a good place to build a snowman.

"That's funny", said Linda. "There's a snowman just outside our gate, and I didn't see anybody making it."

They ran up to the snowman and looked at it. It was well made. It had two snow legs, two snow arms, a blue hat, and a scarf round its neck. Its eyes looked like black diamonds, and it had a pipe in its mouth. As they watched, a puff of smoke came from the pipe. Then another and another.

"Snowmen can't really smoke," said John. He was very good at knowing what was possible and what was impossible. The two children looked at it more closely. The smoke blew across the snowman's face, and melted the snow. The snowman puffed harder at his pipe. More snow melted. Soon his blue hat fell off. The snow had become too soft to hold it. Then the pipe fell to the ground and the snowman's head dissolved into water. There was nobody there. But who had been puffing at the pipe?

Linda and John do not know to this day.

# The Snowman

1. were the names of the children in the story?

2. What did the children put on when they hurried outside?

3. Who did the children throw snowballs at?

4. What was standing just outside the children's gate?

5. What did the snowman have in its mouth?

6. Why did the children's fingers tingle with ice?

7. Why did nobody seem to mind when the children pelted them with snowballs?

8. Why could the children not wait to go out and play in the snow?

9. What month of the year do you think it was (WHY)?

10. Who do you think was puffing at the pipe (WHY)?

# Appendix 5

## Raw pre- and post- test data for Main study

# Appendix 5: Raw pre- and post- test data for cloze test measure

| Group | | Pre- | test | | Post- | test |
|---|---|---|---|---|---|---|
| | 152 | 124 | 129 | 116 | 126 | 125 |
| | 127 | 132 | 155 | 125 | 120 | 177 |
| EA | 138 | 148 | 141 | 129 | 135 | 143 |
| | 132 | 145 | 141 | 146 | 137 | 141 |
| | 131 | 134 | 120 | 129 | 133 | 115 |
| | | | | | | |
| | 104 | 104 | 93 | 111 | 103 | 98 |
| | 113 | 98 | 98 | 120 | 106 | 115 |
| EB | 98 | 91 | 93 | 113 | 106 | 90 |
| | 102 | 91 | 100 | 118 | 97 | 106 |
| | 97 | 95 | 98 | 105 | 103 | 131 |
| | | | | | | |
| | 146 | 129 | 129 | 126 | 135 | 121 |
| | 129 | 131 | 126 | 125 | 120 | 128 |
| CA | 127 | 122 | 126 | 120 | 113 | 110 |
| | 136 | 152 | 139 | 134 | 147 | 139 |
| | 145 | 138 | 131 | 126 | 118 | 118 |
| | | | | | | |
| | 111 | 113 | 109 | 103 | 110 | 116 |
| | 98 | 104 | 104 | 90 | 98 | 102 |
| CB | 98 | 118 | 98 | 11 | 110 | 90 |
| | 109 | 109 | 104 | 102 | 110 | 116 |
| | 91 | 107 | 100 | 97 | 105 | 90 |

## Key

**EA**= Experimental above average:**EB**= Experimental below average

**CA**= Control above average: **CB**= Control below average

n = 15 in each cell

data in months

# Appendix 5: Raw data for comprehension measure

| * | Pre- | test | Post- | test |
|---|---|---|---|---|
| | L | I | L | I |
| S1 | 3 4 4 | 4 4 2 | 5 5 5 | 4 4 5 |
| EA | 2 5 3 | 3 1 3 | 5 5 5 | 4 5 5 |
| " | 1 4 3 | 0 2 3 | 5 4 5 | 4 4 5 |
| " | 3 4 3 | 1 0 2 | 5 5 5 | 2 5 4 |
| S15 | 4 5 3 | 2 2 0 | 5 5 5 | 5 4 3 |
| | | | | |
| | 5 4 3 | 0 1 2 | 5 5 4 | 3 3 3 |
| | 3 3 2 | 3 3 1 | 5 5 5 | 2 4 3 |
| EB | 5 3 3 | 3 3 3 | 4 4 5 | 5 3 5 |
| | 5 4 3 | 3 0 1 | 5 5 5 | 3 5 3 |
| | 2 3 3 | 1 2 2 | 5 5 4 | 5 3 4 |
| | | | | |
| | 2 4 2 | 2 1 1 | 4 5 4 | 0 3 5 |
| | 3 4 4 | 2 1 4 | 5 5 5 | 3 1 5 |
| CA | 3 2 3 | 1 1 2 | 5 3 4 | 4 1 1 |
| | 2 4 5 | 1 2 2 | 4 4 5 | 5 3 5 |
| | 3 4 3 | 2 3 2 | 5 5 4 | 3 5 2 |
| | | | | |
| | 2 3 1 | 1 3 1 | 4 4 2 | 1 5 2 |
| | 3 2 4 | 3 2 1 | 5 4 3 | 4 3 3 |
| CB | 3 3 5 | 2 2 2 | 4 5 4 | 2 3 2 |
| | 1 1 1 | 0 1 0 | 5 4 4 | 3 2 3 |
| | 4 2 1 | 2 2 1 | 5 4 3 | 5 4 1 |

## Key

**EA**= Experimental above average: **EB**= Experimental below average

**CA**= Control above average: **CB**= Control below average

**L**=No. of literal questions answered correctly

**I**= No. of inferential questions answered correctly

* n = 15 in each cell

# Appendix 5: Raw data for Question Generating measure

| * | Pre | _ | test | Post | _ | test |
|---|---|---|---|---|---|---|
| | TE | TI | SI | TE | TI | SI |
| S1 S2 S3 | 0 6 0 | 0 1 0 | 4 0 0 | 0 12 4 | 3 2 1 | 2 0 0 |
| EA | 4 3 1 | 0 0 2 | 0 0 0 | 4 6 7 | 7 0 1 | 0 0 0 |
| " | 0 2 5 | 0 2 0 | 0 0 0 | 6 8 11 | 5 0 6 | 0 0 0 |
| " | 0 0 1 | 0 3 3 | 0 5 0 | 1 3 11 | 6 6 0 | 0 0 0 |
| S13S14S15 | 0 1 3 | 111 0 | 0 1 0 | 0 5 9 | 10 0 2 | 0 0 0 |
| | | | | | | |
| | 4 0 0 | 0 0 0 | 0 0 0 | 8 8 1 | 0 3 3 | 0 1 1 |
| | 0 7 0 | 0 0 0 | 0 0 0 | 1 4 6 | 3 0 0 | 0 0 0 |
| EB | 2 0 0 | 3 4 0 | 0 0 0 | 5 2 2 | 2 3 5 | 0 1 0 |
| | 4 0 1 | 1 0 0 | 0 0 0 | 5 3 0 | 4 3 6 | 0 0 1 |
| | 0 4 6 | 0 0 1 | 0 0 0 | 1 4 3 | 3 4 2 | 0 0 0 |
| | | | | | | |
| | 4 3 0 | 0 2 6 | 0 0 0 | 5 1 0 | 2 2 3 | 0 0 0 |
| | 3 4 0 | 0 1 9 | 0 0 1 | 3 3 0 | 0 0 4 | 0 0 0 |
| CA | 0 1 2 | 0 0 1 | 0 0 0 | 2 7 1 | 0 1 2 | 0 0 1 |
| | 1 4 0 | 1 2 6 | 1 0 0 | 1 12 0 | 3 1 5 | 0 0 0 |
| | 1 6 0 | 5 0 10 | 0 0 0 | 2 6 0 | 3 4 4 | 0 0 0 |
| | | | | | | |
| | 5 7 0 | 0 0 0 | 0 0 0 | 2 8 1 | 1 1 2 | 0 0 1 |
| | 0 4 4 | 0 2 0 | 0 0 0 | 0 6 3 | 0 1 0 | 0 0 0 |
| CB | 0 1 0 | 0 0 0 | 0 0 0 | 0 1 0 | 0 0 3 | 0 0 0 |
| | 6 4 0 | 0 0 6 | 0 0 0 | 2 6 0 | 2 0 1 | 0 0 2 |
| | 0 0 4 | 2 2 0 | 2 0 0 | 0 0 4 | 4 1 0 | 0 0 0 |

## Key

**EA**= Experimental above average:**EB**= Experimental below average

**CA**= Control above average: **CB**= Control below average

**TE**=No. of textually explicit questions generated **TI**= No. of textually implicit questions generated

**SI**=No of scriptally implicit questions generated

* n = 15 in each cell

## Appendix 5: Random Sample of questions obtained from the Question Generating Measure for the Experimental groups

**Subject 1: Experimental, Above average group, Pre-test**

1. Nill response

**Subject 1: Experimental, Above average group, Post-test**

1. ***What were the children doing?***
2. ***What were the children doing when they released the catch?***
3. ***What lay by the dog on the floor?***
4. ***What was the dog doing?***
5. ***How did the door get shut?***
6. ***What had the dog been doing before the door shut?***
7. ***When did they see the dog?***
8. ***Why did one child whisper "Ghosts"?***

**Subject 2: Experimental, Above average group, Pre-test**

1. What told the villagers that they would be troubled no more?
2. Whipping its what tail?
3. The fearful .....of the dragon guided the knight?
4. He ..... as wounded?

**Subject 2: Experimental, Above average group, Post-test**

1. ***Who whispered "Ghosts"?***
2. ***What blotted out the fading day light?***
3. ***What was the dog hunting for?***
4. ***What did he approach?***
5. ***What happened whilst the dog was hunting for rats?***
6. ***Where was the dog lying down?***
7. ***Why were they not daring to breathe?***
8. ***What direction were they facing?***
9. ***Why did the other children not believe the child who whispered "Ghosts"?***
10. ***Why was the dog exhausted?***
11. ***When did their anxiety turn to pity?***

**Subject 3: Experimental, Above average group, Pre-test**

1. Do you think it was a frightening story?
2. Do you like scary or more gentle stories?
3. Do you like stories with dragons and monsters?
4. Do you like stories where people are killed or do you like happily ever after ones?

**Subject 3: Experimental, Above average group, Post-test**

1. ***How do you think the children felt?***
2. ***Where do you think the sort of place the children were? (what question)***
3. ***How did they get there?***
4. ***Why did one child think there were ghosts?***
5. ***Why did the dog cry and whimper?***

**Subject 4: Experimental, Above average group, Pre-test**

1. When did the knight have to attack the creature?
2. The horse and who collapsed?
3. The monster accustomed to speedy What?
4. The knight struck powerfully beneath the beasts what?
5. A despairing what told the villagers they would be troubled no more?

**Subject 4: Experimental, Above average group, Post-test**

1. ***What did the children think it was?***
2. ***What does curiosity mean?***
3. ***How did the children feel when they approached the kitchen door?***
4. ***What was the thing that lay exhausted?***
5. ***What had the dog been hunting for?***
6. ***What kind of noise flooded through the deserted building?***
7. ***What did the children stop doing when they heard the noise?***
8. ***What was the thing they approached?***
9. ***Why had the dog been hunting for rats?***
10. ***How did they feel when they thought it was ghosts?***

**Subject 1: Experimental, *below* average group, Pre-test**

1. The thunder ....
2. What did Jack do when Tina dropped the whip?

**Subject 1: Experimental, *below* average group, Post-test**

***1. Why was it dusk?***
***2. How many people had gathered?***
***3. Who wanted to watch a strange sight?***
***4. Why was there no sign of life?***
***5. Why were they doing this?***

**Subject 2: Experimental, *below* average group, Pre-test**

1. Nill response

**Subject 2: Experimental, *below* average group, Post-test**

***1. Why was there no sign of light?***
***2. Why did the chicks stretch their heads out impatiently?***
***3. Where was the murmuring coming from?***
***4. What swept the beach?***
***5. What was bulging with fish?***
***6. Who staggered up the sand hills?***
***7. Where were their chicks?***

**Subject 3: Experimental, below average group, Pre-test**

1. Who was the lion tamer?
2. What was Jack standing waiting for?
3. Whose whip fell?
4. Who leapt swiftly inside the cage?

Subject 3 continued over leaf

**Subject 3: Experimental, *below* average group, Post-test**

***1. Why did people gather around?***
***2. What ended?***
***3. What did the chicks do?***
***4. Where were they?***
***5. What arose from the crowd?***
***6. What was worn?***
***7. What swept the beach?***
***8. What suddenly finished?***

**Subject 4: Experimental, *below* average group, Pre-test**

1. What did Jack do?

**Subject 4: Experimental, *below* average group, Post-test**

***1. What was there no sign of?***
***2. What murmured?***
***3. What had the penguins thrust?***
***4. What did the penguins have ion their mouths?***
***5. Who gathered around?***
***6. Who was the fish for?***
***7. Where were the penguins?***
***8. What was wonderful?***
***9. What was wonderful?***
***10. What came wading from the surface?***
***11. Who was there fore a while?***
***12. How did the penguins catch the fish?***

# Appendix 5: Random Sample of questions obtained from the Question Generating Measure for the Control groups

**Subject 1: Control, Above average group, Pre-test**

1. Where did the dragon guide the knight?
2. When would the knight attack the creature?
3. Where did the knight strike powerfully?

**Subject 1: Control, Above average group, Post-test**

1. ***How many children whispered ghosts?***
2. ***Was the dog tired?***
3. ***Was It dark or light clouds?***

**Subject 2: Control, Above average group, Pre-test**

Nill response

**Subject 2: Control, Above average group, Post-test**

1. ***What had the dog been hunting for?***
2. ***What door did they approach?***

**Subject 3: Control, Above average group, Pre-test**

1. What does pray mean?
2. What does steed mean?
3. What does territory mean?
4. What does masks mean?
5. What does disappointing mean?
6. What is collapsed?

**Subject 3: Control, Above average group, Post-test**

1. ***Why was the dog hunting for rats?***
2. ***What does proceed mean?***
3. ***What does approached mean?***

**Subject 4: Control, Above average group, Pre-test**

1. What did the creature prepare to do to it prey?
2. What told the villagers they would be troubled no more?
3. What did the knight realise he mustn't do?
4. What guided the knight to the dragon's territory?
5. What did the knight do to make the dragon do away and stop annoying other people?

**Subject 4: Control, Above average group, Post-test**

***1. What was the dog hunting for?***
***2. What made a walling noise?***
***3. What did the children think the noise was?***

**Subject 1: Control, *below* average group, Pre-test**

1. When Jack stood outside was it thunder and lightning?

**Subject 1: Control, *below* average group, Post-test**

***1. What was the name of the people - the boys and girls?***

**Subject 2: Control, *below* average group, Pre-test**

1. What made the lions restless?
2. What happened to Tina?
3. What did the youngest lion do?
4. What did Jack do?

**Subject 2: Control, *below* average group, Post-test**

***1. What did the chicks do?***
***2. What swept the beach?***
***3. What had the people gathered to watch?***
***4. For a while what was there?***
***5. What arose from the crowd?***
***6. What did the penguins do?***

**Subject 3: Control, *below* average group, Pre-test**

1. Who stood wait to clear the ring?
2. What made the lions restless?
3. What fell?
4. Who leaped swiftly inside the cage?

**Subject 3: Control, *below* average group, Post-test**

***1. What swept the beach?***
***2. What came waddling from the surf?***
***3. What ended the parade?***

**Subject 4: Control, *below* average group, Pre-test**

1. What was Jack doing in the ring?
2. What was happening outside the circus?
3. What did the youngest lion do?
4. What did Jack do when he leapt swiftly inside the cage?
5. What did Jack decide to do?

**Subject 4: Control, *below* average group, Post-test**

***1. What were the many people wanting to do?***
***2. Where was there no sign of life?***
***3. What did the penguins do with the fish?***

# Appendix 6

## Letter

Mossend
Bellshill
ML4 2PS
9.12.9.

Dear Paul,

I heard you had a problem with reading your S.P.M.G. Here is what I would do. When I am reading anything I would stop now and again ask myself "Do I underst If I did understand I would go on, but if I didn't I would first of all read the part again. If that didn't help me I wou go futher back in the story and read from there, but as it is S.P.M.G your having problems with and it may be problem solving that you need to read and understand, it would be best if you went on to the next step, which is to summurise that means try to put it into your own words. Once you've done that ask yourself questions, to test yourself out. Questions usualy begin with who, what, why, when, how or where, always go back to the problem solving or story when you are answering the questions. There are three different kinds of questions, the are given, thinking and me questions. A given question has an answer that can be lift straight from the page. A thinking questi has an answer that is there, but is hard to find. A me question has an answer that you will need to know from your own experience. If you can answer the questions you understand. If you can't answer the questions start the step again. Please follow my advice. I know you can do it.

Love from

Katy