AFFECTIVE AND COGNITIVE EMPATHY IN CONDUCT-DISORDERED CHILDREN: PSYCHOPHYSIOLOGICAL AND COGNITIVE UNDERPINNINGS

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This thesis is dedicated to the memory of my father who taught me to keep fighting even when there seems to be no hope. And to my beloved nephew and godson Stephanos with regret for the distress that 'my disappearance' caused him at a vulnerable stage of his life in which explanations would make no sense to him. Signomi Stephane mou.

Abstract

Deficits in affective and cognitive empathy have been implicated in Conduct Disorder (CD), but empirical investigations are surrounded by inconsistencies. Three possible factors, and their interaction, may be implicated: i) distinct causal mechanisms underlying behaviour of CD subgroups (Cichetti & Moffitt, 1993); ii) distinct operation of affective and cognitive empathy; iii) overreliance on verbal measures of affective empathy whose validity has been questioned.

To assess the validity of verbal measures of affective empathy, study 1 compared verbal measures with a direct index of arousal (Heart Rate-HR), in children (N=29, aged 8-10). It was hypothesised that verbal measures would not give analogous information to the direct index, and this hypothesis was supported.

Therefore, the direct index of HR was employed in study 2 to compare affective empathy across three groups: i) CD elevated on Callous-Unemotional traits (CD/CU, n=31) ii) CD low on CU traits (CD/cu, n=29, aged 7.6-10.8) iii) 'typically-developing' controls (n=33, aged 8-10). It was predicted that deficits in affective empathy would characterise only CD/CU children based on data showing emotional deficits and physiological hypoarousal in this group (Frick, *et al.*, 1994b, *Raine, et al., 1990a*). Results showed deficit in affective empathy to characterise only CD/CU children.

CD/cu children did not show deficits in affective empathy, but they may show deficits in cognitive aspects of empathy. Study 3 compared affective and cognitive perspective-taking across i) CD/CU (n=30, aged 7.6-10.8), ii) CD/cu (n=29, aged 7.6-10.8) and iii) 'typically-developing' controls (n=52, aged 8-10). It was predicted that CD/CU children would present deficits in affective but not cognitive perspective-taking. In contrast, CD/cu children did not show deficits in affective empathy in study 2, and other studies have shown cognitive deficits to be more specific to CD/cu children (Loney, *et al.* 1998). It was predicted that CD/cu children would show cognitive- but no affective perspective-taking deficits. Results showed cognitive perspective-taking deficits to be specific to CD/cu children. In contrast affective perspective-taking deficits characterised both CD groups.

These preliminary findings provide evidence of a dissociation between affective and cognitive empathy in CD/CU children. These findings further indicate that neither cognitive nor affective empathy are sufficient for the inhibition of antisocial conduct.

Contents

Chapter 3: Study 2   79
Affective empathy, antisocial conduct and conduct disorder (CD)

Chapter 1

Conduct Disorders: Basis of diagnosis, characteristics, subclassification and aetiology

1.1. Overview

Conduct disorders (CDs) are considered to be one of the most common impairing child psychiatric disorders (Bird, Canino, Rubio-Stipec, Gould, Ribera, Sesman, Woodbury, Huertas-Goldman, Pagan, Sanchez-Lacay, & Moscoso 1988; Costello, Angold, Burns, Stangl, Tweed, Erkanli, & Worthman, 1996; McGee, Feehan, Williams, Partridge, Silva & Kelly, 1990). They constitute a third to a half of all clinic referrals (Farrington, 1995; Kazdin, 1995; Patterson, Reid & Dishion, 1992). The prevalence of CDs depending upon the age, the criteria used and the populations studied is estimated to lie in the range of approximately 6-16 % of boys and 2-9 % of girls (Cohen, Cohen, Kasen, Velez, Hartmark, Johnson, Rojas, Brook & Streuning, 1993; Carr, 1993).

The first chapter introduces issues related to CD that are of critical importance for the studies presented in the current thesis. Section 1.2 discusses the critical issue of determining between 'normal' and 'psychopathological' conduct problems. Section 1.3. describes the basic characteristics and the diagnostic criteria of CD. Section 1.4 addresses the heterogeneity within CD children and discusses approaches to subclassification of CD that have evolved over the years. Finally, section 1.5. explores diverse factors that may be implicated in diverse subgroups of CD. Section 1.6. concludes the main argument and introduces briefly the present research to be presented.

1.2. Differentiating between 'normal' and 'psychopathological' conduct problems

'Conduct problems', 'antisocial conduct', and 'externalising behaviours' all reflect the behaviour patterns that 'inflict physical or mental harm or property loss or damage on others' (Loeber & Schmaling, 1985, p.337). Conduct problems may vary from mild conflicts with authority figures (e.g. opposition, noncompliance,

argumentation, defiance) to violations of social rules (truancy, running away from home) to severe violations of others' rights (stealing, vandalism, physical or mental cruelty to other individuals). Despite the diverse nature of conduct problems, they are usually highly correlated with each other (Frick, Lahey, Loeber, Tannenbaum, Van Horn, Christ & Hanson (1993) and they are therefore referred to as a single psychological dimension.

Determining when a child exhibits conduct problems to the degree characterised as conduct disordered (CD) is a critical issue. Most children show some infrequent forms of conduct problems at some point during the course of their development. On the other hand, there are some children who show extreme patterns of conduct problems, which may even extend to endangering others' and own life. At the extremes it is easy to distinguish between pathological and mild forms of conduct problems. However, between the two extremes, it is very difficult to determine the exact decision point that a child's behaviour should not be taken as normal for his/her developmental stage, and should be considered as pathological, or disordered.

The difficulty in distinguishing between normal and pathological behaviour is an ongoing debate in a substantial number of areas in clinical psychology (see Wakefield, 1992). In most of the approaches that attempt to distinguish between 'normal' and 'psychopathological' antisocial conduct, the behaviour is considered to be 'disordered' only if the child exhibits a variety – and not isolated – conduct problems over a 'substantial period of time'. The difficulty that then arises is how to practically determine the 'variety of conduct problems' and the 'substantial period of time'.

There are two main approaches: Firstly, the method of statistical deviation in which a child is considered as CD if his/her conduct problems exceed some level of deviation (either in type, number, or duration) in a normative sample (e.g. 95th percentile or above). The second method for distinguishing among normal and psychopathological conduct problems has been the presence of symptoms, which determine a significant level of impairment in the child's every day functioning. Most of the 'symptoms' approaches consider the presence of three or more symptoms as critical for distinguishing among normal and pathological conduct problems. The 'three'

symptoms cut-off point has been supported by a number of large-scale studies. For instance, in a large-scale study by Lahey, Piacentini, McBurnett, Stone, Hartdagen, & Hynd (1994) one or two conduct problems did not increase the possibility that a child would be brought to the attention of the police. Whereas children with three or four symptoms were much more likely to be brought to their attention. Therefore, the cut-off number of three symptoms has been considered to be critical point which determines a significant social impairment. Although there is an ongoing debate over which of the two methods of distinguishing between normal and psychopathological conduct problems is more accurate (see Achenbach, 1995) there is usually a high correspondence between children identified as disordered using statistical deviation and those characterised as clinically impaired on the basis of symptoms (Jensen, Watanabe, Richters, Roper, Hibbs, Salzberg & Liu, 1996).

Whichever approach is utilised for deciding between normal and psychopathological antisocial conduct, it is of particular importance to acknowledge the arbitrary distinction between normal and disordered children. In both approaches, for practically distinguishing between normal and psychopathological conduct problems, a line is drawn for distinguishing between 'normal' and 'disordered' children. For instance, if utilising the first approach of statistical deviation and determine the 95th percentile as the critical cut off-point for determining clinical significance, then a child at the 94th percentile will be characterised as 'normal' while the one at the 95th percentile will be identified as 'disordered'. In the same line, if utilising the symptoms approach, the child who shows two symptoms will be characterised as 'normal' and the one who presents three will be characterised as 'disordered'. Therefore, it is important to consider that there may not be so many differences between the children at the borderline above or below the critical point for determining clinical significance.

1.3. Conduct disorder (CD): Basic characteristics and diagnostic criteria

The description of CD across Europe and American is similar, but the classification and diagnostic criteria present slight variations. In the European description the most recent formal classification of CD defines the essential characteristics as 'repetitive

and persistent pattern of dissocial, aggressive or defiant conduct' (ICD-10 - World Heath Organization, 1992). Similarly, in the American description, the most recent formal classification defines the essential characteristics as 'a persistent pattern of behaviour in which the basic rights of others or major age-appropriate social norms are violated.' (DSM-IV, American Psychiatric Association 1994). The DSM-IV and ICD-10 diagnostic criteria and the corresponding *Child Behaviour Checklist* subscales for CD are given in Table 1.1.

The IC-10 identifies an inclusive category of CD, and draws distinctions between: i) CD confined to the family context; ii) undersocialised CD and; iii) socialised CD. The diagnostic guidelines for the inclusive CD, and the distinct diagnostic guidelines for each subtype are listed in Appendix 1 (The distinction between socialised and undersocialised CD, will be covered in more detail in section 1.4.2).

The DSM-IV distinguishes and lists criteria for two distinct CDs: Oppositional Defiant Disorder (ODD) and CD. ODD is discriminated from conduct disorder based on the defiance of rules and argumentative verbal interactions involved in ODD; conduct disorder involves more deliberate aggression, destruction, deceit, and serious rule violations, such as staying out all night or chronic school truancy. The diagnostic guidelines for these CDs are listed in Appendix 1. The usefulness, however, of distinguishing between ODD and CD has been questioned (Rey, Bashir, Schwartz, Richards, Richards, Plapp & Stewart, 1998) for two important reasons: Firstly, developmentally, ODD symptoms are usually a precursor of CD symptoms, while most children who have developed CD maintain the symptoms of ODD. Secondly, ODD and CD share very similar correlates (Faraone, Biederman, Keenan & Tsuang, 1991; Frick, Lahey, Loeber, Stouthamer-Loeber, Christ & Hanson, 1992; Rey, Bashir, Schwarz, Richards, Plapp, & Stewart, 1988). For the purposes of the studies reported here the distinction between ODD and CD is not critical and therefore ODD and CD will be referred as a single category of CD.

To summarise the grounds for CD diagnosis, what is critical for the purposes of the current thesis is that in both European and American approaches, for a child to be classified as CD s/he needs i) to show persistent patterns of a variety of conduct problems ii) across a significant period of time (see section 1.2); iii) not normal for

his/her developmental stage; iv) causing significant disturbance in his/her everyday social or academic functioning.

Isolated, infrequent for example, antisocial acts, which could constitute the breaking of the law and, in effect, would be characterised as delinquent are not in their own right sufficient basis for CD diagnosis. Equally, oppositional behaviour, for instance is often a normal part of development for two to three year olds and early adolescents. However, openly uncooperative and hostile behaviour becomes a serious concern when it is so frequent and persistent that it stands out when compared with other children of the same age and developmental level and when it is detrimental for the child's social, family, and academic life; it is therefore characterised as disordered.

Table 1.1. Diagnostic criteria for CD in DSM-IV, IC-10 and Achenbach's Child Behaviour Checklist

DSM-IV	IC-10	Child Behaviour Checklist
A repetitive and persistent pattern of behaviour in which the basic rights of others or major age-appropriate societal norms or rules are violated, as manifested by the presence of three (or more) of the following criteria in the past 12 months, with at least one criterion present in the past 6 months: **A: Aggression to people and animals** 1. often bullies, threatens, or intimidates others 2. often initiates physical fights 3. has used a weapon that can cause serious physical harm to others (e.g., a bat, brick, broken bottle, knife, gun) 4. has been physically cruel to people 5. has been physically cruel to animals 6. has stolen while confronting a victim (e.g., mugging, purse snatching, extortion, armed robbery) 7. has forced someone into sexual activity **B. Destruction of property** 8. has deliberately engaged in fire setting with the intention of causing	Conduct disorders are characterized by a repetitive and persistent pattern of dissocial, aggressive, or defiant conduct. Such behaviour, when at its most extreme for the individual, should amount to major violations of age-appropriate social expectations, and is therefore more severe than ordinary childish mischief or adolescent rebelliousness. Isolated dissocial or criminal acts are not in themselves grounds for the diagnosis, which implies an enduring pattern of behaviour. **Diagnostic Guidelines** Judgements concerning the presence of conduct disorder should take into account the child's developmental level. Temper tantrums, for example, are a normal part of a 3-year-old's development and their mere presence would not be grounds for diagnosis. Equally, the violation of other people's	**Aggressive Behaviour** (4-18-year-olds) ■ Argues ■ Brags ■ Mean to others ■ Demands attention ■ Destroys own things ■ Destroys others things ■ Disobedient at home ■ Disobedient at school ■ Jealous ■ Fights ■ Attacks ■ Screams ■ Shows off ■ Stubborn ■ Mood changes ■ Talks to much ■ Teases ■ Temper

serious damage

9. has deliberately destroyed others' property (other than by fire setting)

C. Deceitfulness or theft

10. has broken into someone else's house, building, or car

11. often lies to obtain goods or favours or to avoid obligations (i.e., 'cons' others)

12. has stolen items of nontrivial value without confronting a victim (e.g., shoplifting, but without breaking and entering; forgery)

D. Serious violations of rules

13. often stays out at night despite parental prohibitions, beginning before age 13 years

14. has run away from home overnight at least twice while living in parental or parental surrogate home (or once without returning for a lengthy period)

15. is often truant from school, beginning before age 13 years

The disturbance in behaviour causes clinically significant impairment in social, academic, or occupational functioning.

If the individual is age 18 years or older, criteria are not met for Antisocial Personality Disorder.

Specify severity: Mild, moderate or severe)

civic rights (as by violent crime) is not within the capacity of most 7-year-olds and so is not a necessary diagnostic criterion for that age group.

Examples of the behaviours on which the diagnosis is based include the following: excessive levels of fighting or bullying; cruelty to animals or other people; severe destructiveness to property; fire setting; stealing; repeated lying; truancy from school and running away from home; unusually frequent and severe temper tantrums; defiant provocative behaviour; and persistent severe disobedience. Any one of these categories, if marked, is sufficient for the diagnosis, but isolated dissocial acts are not.

Exclusion criteria include uncommon but serious underlying conditions such as schizophrenia, mania, pervasive developmental disorder, hyperkinetic disorder, and depression.

This diagnosis is not recommended unless the duration of the behaviour described above has been 6 months or longer.

tantrums
- Threatens
- Loud

Delinquent behaviour (4- 18 year-olds)
- lacks guilt
- bad companions
- lies and cheats
- prefers older peers
- runs away
- sets fires
- steals at home
- steals outside home
- swears
- thinks about sex too much
- truants
- uses alcohol or drugs
- vandalism

Adapted from DSM-IV (American Psychiatric Association, 1994, IC-10 (World Health Organization 1992, and Achenbach (1991, 1992)

1.4. Subclassification of Conduct Disorders (CD)

Over the last decade an emerging body of empirical literature supports the contention that CD children comprise an heterogeneous group (Cichetti & Rogosch, 1996; Moffitt, 1993b). However, although heterogeneity within CD children is becoming progressively recognised, till now there has been no single acceptable way of classification. As the studies to be reported here attempt to address possible

variations among CD subgroups it would be useful to present alternative ways that have evolved over the years for the classification of the CD children, along with some evidence for their validity.

1.4.1. Subgroups on the basis of form of aggression

In most of the classification approaches, the presence of aggression is critical. Since aggression involves the intention of direct harm to a victim it is not surprising that this is of great concern to society resulting in a great deal of research being focused on it. Two different forms of aggression have been identified: Reactive aggression involves defensive reaction to a perceived threat and it is characterised by anger and hostility (Berkowitz, 1990). Proactive aggression, on the other hand, is unprovoked and occurs in anticipation of self-serving outcomes (Dodge & Coie, 1987). Proactive aggression derives from the social learning theory which holds that aggression is a form of instrumental behaviour sustained by the reinforcing gains of the behaviour (Bandura, 1973). The two patterns of aggression are highly correlated (approximately $r = 0.70$) (Dodge & Coie, 1987) but in a non-symmetric way: while most children showing high levels of proactive aggression also show high levels of reactive aggression, there is a substantial number of children who show only reactive aggression (Dodge & Coie, 1987).

The two forms of aggression appear to have different correlates and developmental course. Children prone to reactive aggression have been found to be at greater risk from social isolation and rejection by their peers than proactively aggressive children (Dodge, Bates, & Pettit, 1990). Proactive, but not reactive aggression has been found to be predictive of subsequent delinquency (Vitaro, Gendreau, Tremblay, & Oligny, 1998). Reactive aggression is more strongly related to a temperamental predisposition for angry reactivity and emotional disregulation (Martgin & Rodeheffer, 1976; Miller & Eisenberg, 1988; Shields & Cicchetti, 1998). Reactive aggression is more strongly related to physical abuse (Dodge et al., 1990). Reactively aggressive children show deficiencies in the processing of social information. They have been found to have difficulties in employing effective problem-solving skills and suffer from attribution bias in ambiguous social situations (Dodge & Coie 1987; Dodge, Lochman, Harnish, Bates & Pettit, 1997). Children involved in proactive

aggression, on the other hand, report fewer symptoms of anxiety and expect a more positive outcome from their behaviour (Dodge & Coie 1987; Dodge *et al.,* 1997). In result this form of aggression is goal directed, such as obtaining dominance in social interactions. Proactively aggressive children are less rejected by their peers than the reactively aggressive (Dodge & Coie, 1987) suggesting that they are more 'socialised'. This difference in the degree of socialisation is related to another classification approach deriving from the clinical tradition: the 'undersocialised' and 'socialised' distinction.

1.4.2. Subgroups on the basis of undersocialised – socialised distinction

Studies of clinical cases of antisocial adults have distinguished 'psychopathic' individuals from other antisocial individuals in that they lack normal emotionality (i.e. they show lack of anxiety, empathy and guilt, they are egocentric and show a callous use of others for their own gains (Frick & Ellis, 1999).

The third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM -III, American Psychiatric Association, 1980) and subsequently the ICD-10 (World Health Organization, 1992) also supported by multivariate statistical studies (for review see Quay, 1986) discriminate between undersocialised and socialised CD. The DSM-III gives a description of the undersocialised types of CD that points towards the extending of the concept of psychopathy in children:

> *The Undersocialised types (of CD) are characterized by a failure to establish a normal degree of affection, empathy or bond with others. Peer relationships are generally lacking, although the youngsters may have superficial relationships with other youngsters. Characteristically the child does not extend himself or herself for others unless there is an obvious immediate advantage. Egocentrism is shown by readiness to manipulate others for favours without any effort to reciprocate. There is generally a lack of concern for the feelings, wishes, and well-being of others, as shown by callous behaviour. Appropriate feelings of remorse are generally absent. Such a child may readily inform on his or her companions and try to place blame on them. (American Psychiatric Association, 1980, p.45).*

Socialised CD on the other hand, is characterised by persistent dissocial behaviour occurring in individuals who are generally well integrated into their peer group (American Psychiatric Association, 1980, World Health Organization, 1992). The key differentiating feature in socialised CD is the presence of adequate, lasting friendships with others of similar age. Often, but not always, the peer group consists

of other youngsters involved in antisocial activities (in which case the child's socially unacceptable conduct may well be approved by the peer group and regulated by the subculture to which it belongs) (World Health Organization, 1992).

Apart from the undersocialised – socialised distinction, the DSM-III (American Psychiatric Association, 1980) went further to make a second distinction in regards to the presence or absence of aggression. Consequently, four CD subgroups resulted: undersocialised/aggressive, undersocialised/nonaggressive, socialised/aggressive and socialised/nonaggressive. The behavioural manifestation of the undersocialised/ aggressive syndrome was defined as physical violence against persons and property (not for defence) and theft with confrontation with the victim. These behaviours are manifested through the context of: i) failure to develop affection, empathy, bonding with others; ii) egocentrism, callousness and manipulative behaviour. The socialised/aggressive syndrome also involves physical aggression and theft with confrontation with the victim but in the context of peer group loyalties and concern for companions. The nonaggressive syndromes involve violation of norms without physical violence of confrontation with victims of theft.

A great deal of research has examined the validity of this sub-classification. In general, these studies support the claim that the socialised/aggressive subgroup is less impaired in terms of cognitive abilities (e.g., Ellis, 1982; Jurkovic & Prentice, 1977), social skills (e.g. Henn, Bardwell & Jenkins, 1980; Quay & Levinson, 1967, as cited in Quay 1993) and stimulation-seeking/impulsivity (Orris, 1969). Psychophysiological studies have shown no differences in electroencephalogram (Mueller & Shamsie, 1967, as cited in Quay 1993), electrodermal responding (Borkovec, 1970) and dopamine-beta-hydroxylase (Rogeness, Hernandez, Macedo & Mitchell, 1982) between the socialized group and the average controls. But the undersocialised/aggressive subgroup has been found to have low serotonin levels and autonomic irregularities (Lahey, Hart, Pizza, Applegate & McBurnett, 1993; Lahey, McBurnett, Lobber & Hart, 1995). Additionally, genetic factors have been found to be more pronounced in the undersocialised/aggressive CD than in socialised/aggressive-like delinquency (Edelbrock, Rende, Plomin, & Thompson, (1995). Also, the undersocialised/aggressive subgroup has been found to have poorer

adjustment in juvenile institutions, and to be more likely to continue to display antisocial conduct in adulthood compared to youth that showed other types of CD (Frick & Loney, 1999; Quay, 1987).

The four subgroups of the DSM-III led to diagnostic confusion especially in discriminating between undersocialised and socialised subgroups (see reviews by Hinshaw, Lahey & Hart, 1993; Lahey, Loeber, Quay, Frick & Grimm, 1992). More specifically, in distinguishing between socialised and undersocialised subgroups some definitions concentrated on the child's ability to form social relationships, while others focused on the context (alone or as a group) in which the antisocial acts took place. Only a few focused on the personality traits and affective characteristics described in DSM-III. Consequently, the revised DSM-III (DSM-III-R, American Psychiatric Association, 1987) in an attempt to set more easily defined characteristics, classify i) a solitary type (if the antisocial acts were committed by the child when alone-a subgroup assumed to be aggressive); ii) a group type (if the antisocial act was committed along with other peers-a subgroup assumed to be non-aggressive) and; iii) an undifferentiated type. But, DSM-III-R gives operational criteria only for a generic CD. These criteria include physical violence to humans and animals, stealing with confrontation as well as stealing without confrontation, and truancy from home and school, thus mixing together the criteria for the undersocialised and socialised aggressive type of CD. The rationale for delineating subgroups in this way was based on the fact that: i) children with undersocialised CD tend to be highly aggressive while most children with socialised CD tend to be non-aggressive; and ii) it is much easier to measure physical aggression and to identify who was present in an antisocial act, rather than measuring empathic concern and feelings of guilt (Hinshaw *et al.*, 1993; Lahey *et al.*, 1992). While this new way of classification eliminated some of the confusion in terms of the DSM-III classification system, it has moved classification criteria further away from affective characteristics (Frick & Ellis, 1999).

The blending of the criteria for the undersocialised and socialised syndromes into a generic CD seemed non-functional as the greater body of research in the area employed the undersocialised – socialised distinction supported by the multivariate

statistical studies (for review see Quay, 1986) the DSM-III (American Psychiatric Association, 1980) and the IC-10 (World Health Organization, 1992).

1.4.3. Subgroups on the basis of concurrent disorders

A distinctive characteristic of CD is that it often co-occurs with other childhood psychiatric disorders. The most frequently diagnosed concurrent disorder is the Attention Deficit Hyperactivity Disorder (ADHD) with 65-90% of CD children also meeting the criteria of inattention, impulsivity and hyperactivity associated with ADHD (Abikoff & Klein, 1992). Children diagnosed with both CD and ADHD present some distinct characteristics from other CD children. They have been found to develop conduct problems at an earlier age, to be more aggressive and to be more likely to use illegal drugs at an earlier age (Thompson, Riggs, Mikulich & Crowley, 1996; Walker, Lahey, Hynd & Frame, 1987). They have also been found to be more likely to show neuropsychological dysfunction. For instance, they have lower autonomic reactivity (Pelham *et al.*, 1991), greater problems in executive functioning (Moffitt & Henry, 1989) and more problems in inhibiting a dominant response (Halperin, O'Brien, Newcorn, Healey, Pascualvaca, Wolf & Young, 1990). Based on this evidence, Lynam (1996) proposes that this group of children exhibit a qualitatively different CD with different causal processes. Lynam (1996) suggests that these children fail to use the feedback from the environment in order to modulate their behaviour, a characteristic typical of the adult psychopath (Newman, 1998). This deficiency leads to an inability to perceive the distress cues caused by his/her own actions which, in turn, leads to deficiencies in the development of empathy and guilt, providing a direct link to adult psychopathy (Frick & Ellis, 1999).

A second childhood disorder often concurrent with CD is anxiety disorder. 60-75 % of clinically referred CD children are also diagnosed with anxiety disorder, while in community samples the range lies between 22-33 % (Zoccolillo, 1992; Russo & Beidel, 1994). The co-occurrence of anxiety disorder with CD seems to be of critical importance as there is evidence that anxiety mitigates the expression of a more severe antisocial conduct. For instance, in a study by Walker, Lahey, Russo, Frick, Christ, McBurnett, Loeber, Stouthamer-Loeber, & Green (1991), CD children who also had an anxiety disorder had less impaired relations with their peers and showed

less conflict with social institutions (e.g. fewer school suspensions, less police contact) compared to children diagnosed with CD only. In the same line, in a study by McBurnett, Lahey, Frick, Risch, Loeber, Hart, Christ, & Hanson, (1991) boys diagnosed with CD but not with anxiety disorder had lower cortisol levels. Such a response (i.e. low cortisol levels), according to Gray's theoretical framework (Gray, 1982), is indicative of a dysfunction in the behavioural inhibition system. Based on these lines of evidence, McBurnett *et al.*, (1991) suggest that CD children without concurrent conduct and anxiety disorder resemble children classified as undersocialised/aggressive.

1.4.4. Subgroups on the basis of time of onset

The DSM-IV (American Psychiatric Association, 1994) employs a dramatically different approach to classifying children with CD. This version of DSM chooses to sub-divide CD children in terms of the time of onset of CD. DSM-IV distinguishes between children whose antisocial conduct starts in childhood (before the age of 11) and those whose antisocial conduct starts in adolescence (Hinshaw *et al.*, 1993; Moffitt, 1993a)

This method of classification appears to be of significant predictive validity. Longitudinal studies have shown that children with childhood-onset of CD are much more likely to develop antisocial conduct in adulthood than children with adolescent -onset (Frick & Loney, 1999). Also, children with childhood-onset have been found to have lower intelligence, greater deficiencies in indices of executive functioning and planning abilities (Moffitt, 1993a). Finally, CD children with childhood-onset have been found to be more aggressive and have much higher comorbitity with ADHD thus capturing two different dimensions that have previously been used for classification of CD children (Lahey, Loeber, Quay, Applegate, Shaffer, Waldman, Hart, McBurnett, Frick, Jensen, Dulcan, Canino, & Bird, 1998; Moffitt, Caspi, Dickson, Silva & Stanton, 1996).

A limitation of the classification of CD children on the basis of the age of onset is that it does not adequately account for the development of CD in girls. Silverhorn and Frick (1999), in their review of the relevant literature, report that girls are much

more likely to show an adolescent-onset of CD. But, despite their later onset, girls with adolescent-onset show similar characteristics to boys with childhood-onset. For instance, they show a chronic course of the disorder with poor adult outcome and they have greater neuropsychological and cognitive deficits (see Silverhorn & Frick, 1999). It has been argued that girls with CD are much less likely to show overt antisocial conduct until adolescence, leading to later diagnosis of CD (Silverhorn & Frick, 1999).

A second weakness of the DSM-IV classification approach is that it does not descriptively designate a particularly severe group that show lack of normal emotionality (i.e. lack of empathy, guilt, remorse). Given the persistent nature of antisocial conduct in the child-onset group it seems more likely that it is within this group that children demonstrating early signs of traits characterised as unemotional or psychopathic can be found (Lynam, 1996).

1.4.5. Subgroups on the basis of Callous-Unemotional (CU) traits

A weakness of all the classification approaches presented so far is the reliance on distinguishing between CD subgroups based on behavioural descriptions. Hypotheses for what processes might underlie different behaviour patterns were made post-hoc. Consequently, most classification approaches do not provide a clear theoretical model that explains different causal processes that might underlie conduct problems across subgroups.

One approach that appears to provide a framework for classifying CD children whilst overcoming these limitations is that recently proposed by Frick and colleagues (Frick, 1998b; Frick, Barry & Bodin, 2000b; Frick & Ellis 1999). This identifies a unique, particularly severe subgroup of CD that developmentally presents high levels of traits characterised as Callous-Unemotional (CU) (e.g. lack of empathy, guilt, remorse, callous use of others).

This is the first time that CD children have been classified explicitly on the basis of CU traits. Many of the classification methods reviewed above identified a particularly severe subgroup of CD children that roughly corresponded to the distinction explicitly proposed by Frick and colleagues (Frick, 1998b; Frick & Ellis

1999; Frick *et al.,* 2000a). For instance, Lynam (1996) identified a subgroup of children diagnosed with both CD and ADHD that showed characteristics similar to the adult psychopath. However, most of the CD children were also diagnosed with ADHD (e.g. Abikoff & Klein, 1992; Lahey *et al.,* 1998) thus making this a rather broad distinction (Frick & Ellis, 1999). More importantly, the blending of poor impulse control characterising ADHD and antisocial conduct (CD) is analogous to the impulsive and antisocial lifestyle dimensions characterising antisocial adults, but within this category only a subgroup will also show CU traits (Hare, Hart & Harpur, 1991). In an analogous attempt, the DSM-III, identified the undersocialised aggressive subgroup characterised by lack of normal emotionality (i.e. lack of empathy, guilt, remorse) and callous use of others. However, there was a considerable confusion as to how the basic characteristics (i.e. CU traits) of this subgroup would be operationalised.

In order to operationalise the CU traits, Frick and Hare (in press), using as a model the revised Psychopathy checklist (PCL-R, Hare, 1991), developed the *Psychopathy Screening Device* (PSD) capturing CU traits (as well as poor impulse control) in children. In the first test of PSD (Frick, O'Brien, Wootton, & McBurnett, 1994b) based on parent and teacher ratings of 92 clinic-referred children, component analysis revealed two dimensions: The first dimension included items tapping into poor impulse control, irresponsible behaviour, narcissism and antisocial conduct. The second dimension included items related to CU interpersonal styles analogous to the psychopathic traits identified in adult samples. To test the divergence validity of these two dimensions, Frick and associates (1994b) formed two scales based on the primary component analysis. The 'poor impulse control/conduct problems' (I/CP) scale included 10 items and had a co-efficient alpha of 0.82. The CU scale contained six items and had a co-efficient of 0.73. The two scales were significantly correlated (r =0.5, p<0.001).

In a subsequent factor analysis study conducted in a normative sample (n=1136) of elementary school-aged children, Frick, *et al.* (2000b) using again a combination of parent and teacher ratings (in analogous fashion to the clinic-referred sample), CU traits again emerged as a factor. In contrast to the clinic-referred sample in which

narcissism and impulsivity formed a single factor, in this normative sample narcissism and impulsivity formed separate factors.

In these two empirical studies, tests of divergence validity of the emerged scales revealed statistically significant but still modest convergence of CU scale to DSM III-R (Frick et al., 1994b) and DSM-IV (Frick et al., 2000b) criteria. I/CP scale, on the contrary, has been found to be highly correlated with DSM criteria. Therefore, Frick and colleagues (2000) reached the conclusion that these findings reveal that DSM criteria do not adequately tap CU traits.

1.4.5.1. Callous-Unemotional (CU) traits designate a particularly severe subgroup of CD children

As discussed earlier, the aim of Frick and colleagues was to use CU traits for designating a particularly severe subgroup of CD children. In adult samples, measures of CU traits have proven to be valid predictors of particularly severe antisocial conduct (Hare et al., 1991). The critical question would be whether, in an analogous way, the presence of CU traits would prove useful for designating a particularly severe subgroup of CD. Indeed, the use of CU traits for the classification of CD children, although in its initial stages of investigation, seems to be promising for the identification of a particularly severe subgroup of CD. Christian, Frick, Hill, Tyler and Frazer (1997), studying 120 clinic referrals (aged 6-13), using cluster analysis, identified two subgroups of CD children. The first CD diagnosed subgroup exhibited high levels of impulsivity, as expressed in the I/CP scale of PSD, but was low on the CU scale. The second CD subgroup showed high impulsivity but also showed high levels of CU traits. This subgroup had a higher rate and a greater variety of CD symptoms, and scored higher on rating scales of conduct problems. This subgroup also showed higher rates of police contacts compared to other clinic-referred children.

Given these results from a clinic sample, this line of research was expanded in delinquent samples for determining whether CU traits would be adequate to predict serious patterns of delinquency. In a study by Silverthorn, Frick and Reynolds (in press) involving a sample of 72 adjudicated adolescents, the boys with childhood-onset of their antisocial conduct scored higher in CU scales than those with

adolescent onset. In a similar empirical investigation, involving a sample of 69 adjudicated male adolescents, scores on the CU scale of the PSD differentiated violent sex offenders from other violent offenders and non-violent offenders (Caputo, Frick & Brodsky, 1999). Importantly, the three groups did not differ on I/CP scores. Given that the childhood-onset of antisocial conduct and violent sex offending are often associated with severity and poor outcome in juvenile delinquency (Frick *et al.,* 2000b), the evidence of the former studies considered together seem to suggest that CU traits are valuable for predicting serious patterns of antisocial conduct in children/adolescents. But additional evidence for the validity of the classification approach, based on the CU traits, would be derived if empirical studies reported distinct correlates between CD children high on CU traits (CD/CU) and those low on CU traits (CD/cu).

1.4.5.2. Distinct correlates between CD/CU and CD/cu children

In adult psychopathology literature there is evidence to suggest that antisocial adults high on CU traits in contrast to other antisocial individuals also show evidence of deficits in the processing of emotional stimuli such as lower anxiety, diminished fearfulness (Hare, *et al.,* 1991). In an analogous way, an emerging body of evidence suggests that CD/CU children show lack of fearful inhibition and other deficits in the processing of emotional stimuli. For instance, CD/CU children showed a preference for thrill and adventure seeking activities (Frick, *et al.,* 1994b) and greater sensitivity to rewards than to punishments (O' Brien & Frick, 1996).

Apart from the deficits in the processing of emotional stimuli evident in CD/CU children, correlational studies revealed distinct correlates for this subgroup of CD children. CD/CU children have been found to be less likely to be raised in families with ineffective parenting strategies (Wootton, Frick, Shelton & Silverhorn, 1997) and less likely to show intellectual deficits (Christian *et al.,* 1997; Loney, Frick, Ellis & McCoy, 1998).

Based on this line of evidence, Frick (1998) proposed that CU traits designate two distinct subgroups of CD children. According to Frick, problems of impulse control are evident in both subgroups but they are developed through distinct causal

pathways. CD/cu children are proposed be a more diverse group and their failure to develop appropriate behavioural control may have developed through distinct causal pathways or the combination of various factors. For instance, some children may have developed a hostile attribution bias resulting from being raised in an abusive home environment (Dodge *et al.*, 1990). Others may have been raised in environments, where they were not taught to control their impulses and respect the rights of others (Frick, 1994). Still others may have difficulties in anticipating the consequences of their behaviour or delaying gratification due to low intelligence (Loney *et al.*, 1998).

In contrast, Frick (1998) proposes that CD/CU children comprise a more homogenous subgroup. Their temperament is perceived to be characterised by low behaviour inhibition underlined by underactivity in the autonomic nervous system. Behavioural and physiological data provide evidence in support of this contention. Low behavioural inhibition is considered to be manifested behaviourally by low fearfulness to novel or threatening situations and poor responsiveness to punishment cues (Kaman & Sandman 1991; Rothbart, 1989). Indeed, as discussed above, empirical data provide supportive evidence that CD/CU children show high levels of thrill and adventure seeking (i.e. fearlessness; Frick *et al.*, 1994b; Frick, Lilienfeld, Ellis, Loney & Silverhorn, 1999) and diminished responsivity to punishment cues (O' Brien & Frick, 1996), both of which are indicative of low behavioural inhibition. In terms of the physiological evidence, indeed autonomic underactivity has been typically manifested in CD children designated as undersocialised, 'psychopathic' or as exhibiting high CU traits (Lahey *et al.*, 1995).

1.4.5.3. Concerns over the classification of CD children on the basis of CU traits

The subclassification of CD children in terms of the presence of CU traits, a classification that resembles the adult conceptualisation of psychopathy, has raised a number of legitimate concerns. The first is the negative connotation that the concept of 'psychopathy' has for treatment success and long-term outcome. The second is that the label 'psychopathy' implies a biological predisposition for the dysfunction. These concerns justifiably emphasise that the negative prognosis attributed to adults

should not be generalised in children unless consistent longitudinal data are available.

However, although the subclassification of CD children, in terms of the presence of CU traits, raises legitimate concerns for explicitly applying the concept of psychopathy in children, the most common alternative approach of implicitly considering all the CD children as evolving psychopaths (e.g. Richters & Cicchetti, 1993) is more problematic (Frick & Ellis, 1999). Frick and colleagues argue that by being more explicit in identifying the CD children who demonstrate early signs of psychopathy, one can begin to investigate the critical questions related to the stability of these traits in children and the complex interplay of the dispositional and environmental factors associated with these traits (Frick *et al.*, 2000a).

1.5. Aetiology of Conduct Disorder (CD)

A wide range of risk factors have been implicated in CD, but clear comprehension of the aetiology of the CD is a formidable task for two main reasons. Firstly, there seems to be a variety of factors implicated in it which interact with each other, and the interplay between these factors at different stages of the child's development may differ. Secondly, it is plausible that there are diverse developmental trajectories through which CD develops, an issue that is often neglected by empirical investigations.

Reviews on the aetiology of CD (e.g. Lytton, 1990) usually distinguish between two categories of factors implicated in CD, 'child predispositions' and 'family/social' factors. This distinction seems to point towards the on-going nature/nurture dispute, with 'child predispositions' being inherited and remaining unchanged across the child's development, and 'family/social' factors affecting the child irrespective of his/her dispositions.

The distinction between 'child predisposition' and 'family/social' factors is misleading (Plomin & McClearn, 1993). Many of the so-called predispositions are likely to have been caused by 'family/social' factors; while sometimes even biological factors are likely to have been caused or shaped, at least partly, by social

factors (Fox, Calkins & Bell, 1994). Conversely, 'child predispositions' can shape his/her social context (Lytton, 1990; Scarr & McCartney, 1983). Therefore, the presentation of 'child' and 'family/social' effects in the subsection that follows is artificial in order to simplify the way the material is set out. The denoted subsections do not imply a distinction between nature and nurture factors, but are only used to facilitate the discussion of categories of causal factors investigated across different studies.

1.5.1. 'Family/social' factors

A wide range of 'family/social' factors have been implicated in CD (for review see Frick 1993, 1994; Loeber & Stouthamer-Loeber, 1986). However, identifying distinct 'family/social' factors that may have a causal effect in the development of CD is a difficult task for two important reasons: Firstly, a single 'family/social' factor seldom exists on its own. It rather seems to be the case that a wide range of factors interact with each other, often in a complex way, resulting in the development of CD. Secondly, 'family/social' factors may interact with 'child' factors in a complex way. In other words, the specific factors of a social environment that have causal influence in the development of CD may vary depending on the child's temperamental characteristics. For instance, different temperaments appear to require different parental practices to control their behaviour (Kochanska, 1993). Consequently, across individual children dissimilar aspects of the social environment may interact with dissimilar temperamental characteristics leading to the development of CD (e.g. Colder *et al.*, 1997, Frick, 1998) through diverse trajectories.

Without ignoring these critical issues, from the wide range of family factors that have been implicated in CD (for review see Frick, 1993, 1994; Loeber & Stouthamer-Loeber, 1986), the present section briefly and selectively reviews the categories of 'family/social' factors that have been well replicated and seem to have causal influence in the development or sustenance of CD. These include parents' socialisation practices, parents' marital relationship, parental psychopathology and peer rejection.

19

1.5.1.1. Parental socialisation practices

Given that CD is considered to be a failure of the child to be adequately socialised, and that parents are the primary socialisation agents of the child, it seems justifiable that parental socialisation practices are considered to be one of the most critical family factors implicated in CD (Frick, 1993, 1994). Indeed, a wide range of empirical data has consistently shown that parental practices are implicated in CD (Loeber & Stouthamer-Loeber, 1986).

A critical issue is which specific parental practices are determinant of the development of CD. This question was addressed in most of the empirical studies included in a meta-analysis by Loeber & Stouthamer-Loeber (1986). In their meta-analysis, Loeber & Stouthamer-Loeber concluded that the most significant specific parental practices that predicted development of CD were:

i) lack of parental involvement in child's activities (e.g. time spent together, involvement of parent in school activities, parental knowledge of child's friends), with the lack of father involvement a somewhat stronger predictor than lack of mother involvement;

ii) lack of parental supervision; across longitudinal studies, lack of parental supervision was one of the strongest predictors in children living in poor inner-city neighbourhoods (Loeber & Stouthamer-Loeber, 1986); and

iii) inconsistent and/or harsh discipline. Inconsistent discipline makes it difficult for the child to learn the message that is being conveyed through the discipline. Consequently, inconsistent discipline may inadvertently reinforce the child's negative behaviour (Patterson, 1982). Harsh discipline, on the other hand, may result in the child overfocusing on his/her adverse state and prevent him/her from internalising the message or the values conveyed (Kochanska, 1993).

1.5.1.2. Parental Psychopathology

In reviews of the relevant literature (e.g. Lahey, Piacentini, McBurnett, Stone, Hartdagen, & Hynd, 1988), parental psychopathology has consistently been linked with CD. The more specific aspects of parental psychopathology that have been

implicated in the development of CD have been parental substance abuse, depression and antisocial/criminal conduct (Frick, 1993). However, parental substance abuse and depression have been implicated in other child disturbances, not only in CD (e.g. West & Prinz, 1987). Consequently, the link of CD to parental substance abuse and depression seems to be non-specific. In contrast, the relation of CD to parent antisocial conduct seems to be more specific. Parents of CD children have consistently shown higher levels of antisocial personality disorder relative to parents of children with other forms of adjustment problems (Faraone, *et al.*, 1991; Frick *et al.*, 1992; Lahey *et al.*, 1988).

Empirical studies addressing the issue of how parental psychopathology is associated with CD have often indicated that the link between parental psychopathology and CD is mediated by disrupted parental practices (Forehand, Lautenschlager, Faust & Graziano, 1986; Laub & Sampson, 1988; Patterson & Capaldi, 1991; Patterson *et al.*, 1992). For instance, parental depression may disrupt parent – child interactions (e.g. make the parent less involved in child's activities) and make it more difficult for the parent to use effective discipline practices (e.g. use consistent discipline; Forehand *et al.*, 1986). Similarly, parents with antisocial personality disorder have been found to be more likely to use poor socialisation practices which, in turn, could lead to the development of CD (Laub & Sampson, 1988; Patterson & Capaldi, 1991).

1.5.1.3. Parental divorce

A further family dysfunction factor implicated in CD is parental divorce/ separation. In a meta-analysis by Amato & Keith (1991) of 92 empirical studies, three plausible explanations were investigated for why divorce is associated with CD: i) the loss of parent through the divorce; ii) the disruptions in the family environment following the divorce (e.g. loss of income), and; iii) the presence of high parental conflict prior and/or post-divorce. Amato and Keith reached the conclusion that the third factor (i.e. conflict prior and/or post-divorce) seemed to be the most critical. This conclusion was based on findings that while children of divorced families had poorer adjustment relative to children of low-conflict 'intact' families, children in high conflict 'intact' families had poorer adjustment relative to children in divorced families. Additionally, divorced families who had less conflict pre and post-divorce

had children who adjusted better relative to divorced families who had overt pre and post-divorce conflict.

1.5.1.4. Peer rejection

A significant social factor often implicated in CD is peer rejection. CD children lacking social skills seem to be rejected by their peers from the very initial stages of their development (Coie, Dodge & Kupersmidt, 1990). Consequently, their rejection from normally developing peer groups deprives them from the socialising experiences that they would otherwise acquire in their interaction with prosocial children (Reid, 1993). Rejection from normally developing peers pushes the CD children who lack social skills toward deviant antisocial peer groups (Elliot, Huuizinga & Ageton, 1985; Emler, Reicher & Ross, 1987; Keenan, Loeber, Zhang, Stouthamer-Loeber & Van Kammer, 1995). Within these deviant peer groups their antisocial conduct increases in degree and severity (Patterson *et al.*, 1992) Sequentially, they are trapped in a deviant subculture with no opportunities to progress in a prosocial manner (Moffit, 1993a).

1.5.2. 'Child' factors

As discussed above, the distinction between 'child' and 'family/social' factors implicated in CD is an arbitrary approach for the sake of the organisation of the factors that may be implicated in CD. While 'child' effects might shape the 'family/social' factors, many of the considered-to-be 'child' effects may in fact have their roots in environmental factors. An illustration of how 'child' effects may result from 'family /social' effects is the potential link between hostile attribution bias and abusive home environment that will be discussed below.

1.5.2.1. Social information processing deficits

An important category of factors that have been implicated in CD are social information processing deficits. Social information processing refers to the consecutive processes involved in the interpretation of social information and, on the basis of this interpretation, choosing an appropriate response (see Crick & Dodge, 1996). These consecutive processes include: i) encoding social cues; ii) interpreting

these cues; iii) clarifying social goals; iv) accessing possible responses, v) deciding on an appropriate response and; vi) enacting the behaviour response.

There is evidence to suggest that in certain CD samples, deficits have been evident in at least three of the consecutive stages involved in information processing. Firstly, aggressive CD children have been found to show a hostile attribution bias in ambiguous provocation situations (Dodge & Frame, 1982). Secondly, aggressive CD children have been found to misinterpret their own behaviour. For instance, they have been found to minimise the maladaptive nature of their behaviour (Lochaman, 1987). Thirdly, samples of CD children have been found to be less able to generate nonaggressive alternatives in response to provocations relative to control children (Dodge & Frame, 1982; Perry, Perry & Rasmussen, 1986).

More recent evidence suggests that deficits in social information processing may be more specific to a certain subgroup of CD children, that is, those who show reactive forms of aggression. Deficits in social information processing do not appear to apply to children who show predominantly proactive aggression (Crick & Dodge, 1996). Proactive aggression has been suggested to be closely related to CU traits (Cornell, Warren, Hawk, Stafford, Oram, & Pine, 1996). Consequently, it has been proposed that social information processing deficits apply to CD/cu children and, even more specifically, to those who show reactive aggression (Cornell *et al.*, 1996).

The developmental pathway through which social information processing deficits develop is unclear. One possibility specifically linked to hostile attribution bias is that this bias develops as a child is being raised in a hostile and abusive home environment (Dodge, *et al.,* 1990). Hostile home environments present a view of the world as threatening and hostile. Consequently, children raised in such environments would generalise hostile attribution bias across a wide range of social situations. This theoretical account could, in part, provide an explanation of why children brought up in abusive home environment have been found to be at a greater risk of developing CD (Dodge *et al.*, 1990).

1.5.2.2. Low intelligence and academic underachievement

A further factor that has been implicated in CD has been low intelligence. Empirical data have documented intelligence deficits, especially in verbal intelligence in CD samples relative to controls (see Hinshaw, 1992; Moffitt, 1993b). There have been several theoretical approaches addressing how low intelligence might be linked to CD (see Moffitt, 1993b). Among these, four have been the most dominant. Firstly, low verbal intelligence has been proposed to have detrimental effect in a child's ability to generalise learning, and more specifically, in learning which behaviours are appropriate and which are not. Secondly, intellectual deficits might be detrimental for the development of self-control strategies, such as ability to delay gratification and anticipate consequences. Thirdly, intellectual deficits might limit child's responses to ambiguous or threatening situations and consequently, make it more likely to respond aggressively. Fourthly, a child with lower intelligence might be less likely to evoke positive interactions with socialisation agents (especially parents) and less likely to be successful at school. In turn, these adverse experiences might result in the child not having a strong social bond with the significant socialisation agents of parents and school.

In line with other factors implicated in CD, intellectual deficits seem to be linked with specific subgroups of CD children. Children with adolescent-onset CD have been found to be less likely to show intellectual deficits (Moffit, 1993a). While there is some relatively more recent evidence that suggests that even within the childhood-onset CD children, deficits in intelligence seem to be primarily related to the development of CD/cu children (Christian *et al.*, 1997). This finding accords with early descriptions of individuals characterised as psychopathic, in which the presence or absence of intellectual deficit was considered to be one of the distinctive features between 'psychopathic' and non-psychopathic antisocial individuals.

Shifting the discussion to the learning difficulties correlate of CD (Hinshaw, 1992), it can be argued that such difficulties cannot be fully explained by intellectual deficits. There is evidence to suggest that about 25% of CD children manifest academic underachievement relative to their intellectual levels (Frick, Kamphaus, Lahey, Loeber, Christ, Hart & Tannenbaum, 1991).

At least two distinct developmental pathways have been proposed that link academic underachievement to CD (Hinshaw, 1992). In CD children within the childhood-onset category, academic underachievement seemed to be at a significant extent explained by Attention Deficit Hyperactivity Disorder (ADHD) (Frick *et al.*, 1991). In contrast, in CD children within the adolescent-onset category there seems to be a number of adolescents who developed their conduct problems partially as a function of school failure.

1.5.2.3. Overresponsiveness to rewards, underresponsiveness to punishments

In a series of classic studies, adult (Lykken, 1957) and subsequently child and adolescent samples (e.g. Patterson, 1976; Davies & Maliphant, 1974) with conduct problems were found to have a diminished ability to learn from punishment. For instance, CD adolescents acquired avoidant responses less efficiently than controls in a situation where errors were punished by an electric shock (Davies & Maliphant, 1974). Although this may not be entirely true, more recently it has been suggested that individuals with conduct problems do not have a global deficit to learn from punishment but they may, in fact, overconcentrate on rewards (i.e. reward-dominance response) resulting in a lack of attention to punishment cues (Newman, Paterson & Kosson, 1987). For example, they may be overdriven by the reward that an antisocial act (e.g. steal money) would give them rather than the punishment (go to jail). Indeed, reward-dominance response has been evident in CD samples across time and reporters (e.g. Daugherty & Quay, 1991; O' Brien, Frick & Lyman, 1994; Shapiro, Quay, Hogan & Schwartz, 1988). Data, however, are not consistent. Reward-dominance response style has been suggested to be largely confined to CD/CU children (Brien & Frick, 1996).

This reward-dominance response style has been explained by two theoretical approaches. In the framework of the theory developed by Gray (1982) and further elaborated by Fowels (1980) it is suggested that in individuals with conduct problems, lack of behaviour inhibition is due to a deficient Behaviour Inhibition System (BIS). In this theory, the findings across certain CD samples of: i) hyporesponsivity of the Skin Conductance Response (SCR) and its slower recovery, and; ii) lower levels of serotonic and adrenaline (which are considered to be the

neurotransmitters involved in the BIS, Gray, 1982) are viewed as manifestations of a deficient BIS. On the other hand, Newman (1998) argues that the reward-dominance style results from a specific cognitive deficit related to the ability to shift goal-directed behaviours in response to changes in contingencies. In this explanation, individuals with conduct problems have more general difficulty in shifting their attention from any established response set, not only the reward-oriented response set.

1.5.2.4. Genetic, neurochemical and neurophysiological factors

A considerable body of empirical data has consistently reached the conclusion that there is a substantial genetic predisposition in child and adult severe conduct problems (for a review see Mason & Frick, 1994; Rutter, Macdonald, LeCouter, Harrington, Bolton & Abiley, 1990). At the same time, however, the same findings provide equally compelling evidence for the contribution of non-genetic factors. For instance, Mason and Frick (1994) reached the conclusion that 50% of the variance in measures of conduct problems is accounted by genetic factors, allowing the remaining 50% of the variance to be explained by non-genetic contributions. Instead of long-standing debates on the nature vs. nurture hypothesis, a more crucial issue to address would be how these genetic factors lead to the development of CD, as genetics do not typically determine behaviour in a direct way. Instead genetic predispositions may place certain individuals at greater risk by creating the blueprint for developing temperamental tendencies that may result in conduct problems behaviour.

One such category of risk factor, that has been implicated in the development of CD, is neurochemical/neurophysiological irregularities. Across several studies, samples of CD children have shown higher levels of testosterone (Olweus, Mattesson, Scalling & Low, 1988; Scerbo & Kolko, 1994), lower levels of serotonin (e.g. Kreusi *et al*; for a review see Lahey *et al.*, 1993) and lower levels of adrenaline (Magnusson & Öhman, 1987; Magnusson, 1988; Olweus, Mattesson, Scalling & Low, 1988; Scerbo & Kolko, 1994). Of particular importance for the studies that will be reported here, autonomic nervous system irregularities have been demonstrated in CD samples across time and researchers. More specifically, CD samples have shown

decreased autonomic reactivity on Heart Rate (HR) measures (e.g. Raine, Venables & Williams, 1990a), Skin Conductance (SC) measures (e.g. Scmidt, Solanto & Bridger, 1985) and event-related electroencephalographic potentials (e.g. Raine, Venables & Williams, 1990c). It has been suggested that CD children may inherit decreased baseline autonomic nervous system activity, thus requiring greater stimulation to achieve optimal arousal (Lahey *et al.*, 1993; Raine, Venables & Williams, 1990a; 1990b; AACAP Official Action, 1997). This hereditary factor has been suggested as accounting for the high level of sensation-seeking activity associated with CD (AACAP Official Action, 1997).

Empirical data, however, have not been undisputed. Neurophysiological and neurochemical abnormalities have not been evident in all CD samples (e.g. Constantino *et al.*, 1993; Gerralda, Connel & Taylor, 1991). One explanation might be the heterogeneity within the CD children. Neurophysiological and neurochemical abnormalities may be a distinct characteristic of a subgroup of CD children. Indeed, in their review of the relevant empirical literature, Lahey *et al.*, (1993) reached the conclusion that the data suggest that neurochemical irregularities and autonomic hypoarousal seem to characterise only those CD children/adolescents who are characterised as aggressive, undersocialised psychopathic, or CU.

1.6. Conclusion and the current research

In conclusion, the review of empirical literature presented above by and large suggests that there is a substantial heterogeneity among CD children. The recognition of this heterogeneity may be particularly important to research on potential deficits in affective and cognitive dimensions of empathy in CD. It is plausible that deficits in affective and/or cognitive empathy that have long been implicated in CD do not apply across CD children in a uniform pattern. For instance, autonomic hypoarousal evident in certain subgroups of CD children (characterised as CU or psychopathic) may provide the physiological underpinnings of deficits in the capacity for vicarious affective arousal (i.e. affective empathy). On the other hand, deficits in the purely cognitive dimensions of empathy (i.e. cognitive perspective-taking) might characterise another subgroup of CD children; for instance, those low on CU traits

(CD/cu), on the basis of some empirical data suggesting that the intellectual deficits that have long been implicated in CD seem to be more specific to CD/cu children. It is further plausible that affective and cognitive dimensions of empathy operate differently across CD subgroups.

Consequently, study 2 and study 3 presented here set out to explore potential differentiated deficits in affective/cognitive empathy in subgroups of CD children. However, the measurement of affective empathy has been formidable for the researchers. Hence, chapter 2 focuses on problems surrounding the measurement of affective empathy. Within this framework, study 1 explores the validity of the measures of affective empathy that have most commonly been used in research with children.

Chapter 2

Conceptualisation of empathy, developmental models, and measurement of affective dimensions of empathy in children

2.1. Overview

The current chapter focuses on the conceptualisation of the term empathy (section 2.2), developmental models of empathy (section 2.3), and sets operational definitions for the terms affective empathy and cognitive empathy (section 2.4). It then introduces the case for independent (to the greatest extent possible) assessment of affective and cognitive dimensions of empathy (section 2.5). Section 2.6 addresses concerns raised over the validity of the indirect self-report measures of affective empathy which have been the most widely used methods. This section outlines the rationale, reports the method and results and discusses the findings of study 1, which set out to investigate whether the indirect self-report measures of affective empathy, or facial expressions provide analogous information with direct physiological indices. If so, concerns over the validity of indirect indices would be unjustified, and their interchangeable use would not be problematic.

2.2. Conceptualisation of empathy

Empathy is often viewed as a vital human attribute supportive of social life, but it has perhaps been one of the most elusive concepts in the literature and problems of definition abound. Long ago, Smith (1759 in Schneider, 1948) described empathy as the ability to understand another person's perspective and have a visceral emotional reaction. This conceptualisation is reflected in the etymology of the word 'Empathy', deriving from the Ancient Greek 'empatheia' which literally means 'within' (en) 'suffering' (pathos). Following Smith's conceptualisation, research tradition has variously emphasised the more cognitive dimensions of empathy (Borke, 1971; Hogan, 1969), using it interchangeably with the term 'affective perspective-taking', or the affective dimensions, meaning the vicarious affective response to others (Katz, 1963; Hoffman, 1984; Mehrabian & Epstein, 1972). Still others have emphasised both cognitive and affective contributions to empathy (Strayer, 1993).

2.3. Developmental models of empathy

Hoffman, (1975, 1977, 1987) gives primacy to the affective dimensions of empathy, and postulates a biological preparedness already present in infancy. Hoffman (1975, 1977, 1982a) suggests that the observation of distress in others triggers an innate 'empathic distress' response in the child, even before the child has the cognitive capacity to differentiate 'other' from 'self'. Empirical data have provided support for the early origins of the capacity for empathy (Zahn-Waxler, Radke-Yarrow, Wagner & Chapman, 1992). In Hoffman's (1975, 1977, 1987) developmental model of empathy, the affective dimensions of empathy are experienced differently as a child progresses through changes in social-cognitive processing. Specifically, cognitive transformations in a child's conception of other persons (social-cognitive stages) change how the affective dimensions are experienced (Hoffman, 1987).

More specifically, in Hoffman's developmental model of empathy an infant moves from: i) global empathy, in which the fusion of self and other, present in the first year of life, tends to elicit a global empathic distress response, to; ii) 'egocentric' empathy, in which a child experiences empathic distress while becoming progressively aware that another person is suffering and not the self; but is not able to distinguish fully between own and other's affective state, to; iii) at some point during the second year the initial cognitive capabilities for perspective-taking permit empathy for another's feeling and a rudimentary sense of others as having inner states (i.e. thoughts, feelings) separate from their own. By three or four years, the development of language and the ability to derive meaning from symbolic cues further enables the child to empathise with a wide range of emotions. This broadening of emotional responsivity continues until; iv) late childhood where this emerging conception of self/others as separate entities with separate histories and identities, and awareness that others have feelings beyond the immediate situation, is further developed.

Hoffman's (1982a) model includes six hypothetical modes of empathy. The first four modes are primarily involuntary and predominate in infancy and early childhood. They include mimicry or automatic imitation, conditioning and direct association. The remaining two modes evolve from both symbolic associations (including

pictorial and verbal communication) between another's emotions and the self's past emotions and cognitive perspective-taking. Perspective-taking is different in that it usually involves a voluntary cognitive act whereby one imagines oneself into another's place. Empathy comes to motivate behaviour (either prosocial or antisocial) in the form of a drive to reduce one's own distress aroused by another's affective state (Hoffman, 1982a). Consequently, individuals with developmental histories deficient in opportunities to associate one's own emotions with those of others and perspective-taking would be unlikely to develop empathically-driven prosocial motivation (Hoffman, 1982a).

Feshbach (1987) posits a multidimensional view of the development of empathy, which stresses the importance of cognitive maturation in empathic responsiveness. Feshbach postulates that the empathic reaction is a function of three factors: i) the cognitive ability to discriminate affective cues in others; ii) the more mature cognitive skills entailed in assuming the perspective of another person and; iii) emotional responsiveness that is the affective ability to experience emotions. Feshbach, in line with Hoffman (1982a), emphasises the primacy of the affective experience in empathy and notes that its outward affective manifestations probably change with development. The automatic mirroring of a felt emotion in a young child's face (i.e. motor mimicry) is generally replaced by more subtle cues of emotional experience in the older children such as voice quality, body language and verbal communication (Hoffman, 1977).

Most developmental views emphasise the social learning contribution to empathy (Feshbach, 1982; Hoffman, 1982a; Radke-Yarrow, Zahn-Waxler & Chapman, 1983). Hoffman (1982a), for instance, states that moral encounters occurring naturally in the process of socialisation come to be associated with empathic affect and that the moral norms associated with that affect are encoded in the semantic memory as affectively charged representations. During these moral encounters, the use of inductive discipline promotes a child's attention to the message conveyed which increases the possibility for the conveyed moral norm to be genuinely internalised. Once genuinely internalised, these moral norms eventually come to elicit behaviour

via the symbolic association and perspective-taking modes of activation outlined above.

2.4. Definitional issues

As discussed above (section 2.2), in the psychological literature empathy has been variably defined as: i) apprehension of another's emotional state (i.e. affective perspective-taking); ii) vicarious affective arousal stemming from another's affective state; or even, as a; iii) joint operation of affective perspective-taking and vicarious response to another's affective state. In the current thesis, vicarious affective arousal will be termed 'affective empathy'. Affective perspective-taking, given that it combines affective and cognitive (i.e. taking the cognitive perspective of another) elements, will be termed 'combined affective/cognitive empathy'. Cognitive perspective-taking (i.e. apprehension of another's thought) on which affective perspective-taking merely depends will be termed 'purely cognitive' empathy.

A further definitional issue applying to the concept of empathy must be delineated. The term empathy (in its affective conceptualisation) has often been used interchangeably with the term sympathy. For the purposes of the current thesis, affective empathy and sympathy are differentiated. Sympathy is operationalised as concern for another's affective state stemming from the apprehension of this 'other' affective state or condition (Eisenberg, Fabes, Murphy, Karbon, Maszk, Smith, O'Boyle, & Suh, 1994a). This, response may or may not match what the other person is feeling (or assumed to feel). Sympathy often results from affective empathy, although it may also be based on cognitive perspective-taking or encoded cognitive information relevant to another's situation accessed from memory (Eisenberg, 2000). Moreover, it should be noted that affective empathy does not always necessarily lead to sympathy.

2.5. Affective and cognitive dimensions of empathy: the case for independent assessment

It has been postulated that affective and cognitive dimensions of empathy interact: the ability to respond vicariously often depends on the extent to which one can cognitively infer another's emotional state; whilst the vicariously aroused affect supplies inner cues to the observer that may add meaning to the affect that s/he infers in another (Hoffman, 1982a). However, the two dimensions might need to be assessed independently (to the greatest degree possible), as there is evidence to suggest that in certain cases the two dimensions seem to operate independently. For instance, Hoffman (1975, 1977, 1982a) suggests there is a biological preparedness for empathy already present in infancy. Hoffman argues that the observation of distress in others triggers an innate 'empathic distress' in a child even before s/he has the cognitive capacity to differentiate 'other' from 'self'. Empirical data confirms the early origins of this capacity (Zahn-Waxler, *et al.*, 1992). For example, it is unlikely that the infant who runs to get his/her mother when a confederate is crying, can cognitively infer the other's emotional state. Conversely, the cognitive capacities of sociopaths who are not intellectually handicapped with respect to the normal population, does not guarantee access to emotional empathic information which presumably the sociopaths lack (Mealey, 1992). This double dissociation paradigm seems to suggest therefore, that the two dimensions of empathy might need to be assessed independently so as not to draw faulty conclusions in cases where the two dimensions might operate independently.

2.6. Measurement of affective empathy in children: Study 1

2.6.1. Introduction

2.6.1.1. Indirect self-report measures of affective empathy

Affective empathy has received increased attention as a research topic but its measurement has been viewed as formidable by the investigators. In most of the existing research, up until a few years ago, self-report indices were the sole measures of vicarious affective responsiveness, particularly in studies with children. The most popular method has been the picture-story method, and in particular the FASTE

(Feshbach Affective Situations Tests of Empathy; Feshbach & Roe, 1968). This technique involves exposing a child to the affective state of another by means of pictures/stories and asking this child to report his/her affective state. This technique has been widely used but its validity has been questioned (Eisenberg & Lennon, 1983; Hoffman, 1982a). Firstly, the original scoring method requires a child to report an emotion exactly matching the protagonist's in order to be credited with an empathic response; a procedure which might underestimate the true level of affective sharing. For instance, it has been questioned whether a child who says that s/he feels sad in response to another's fear is any less empathic than one who says that s/he feels afraid. Or even a child who responds that s/he feels bad because s/he lacks the cognitive and linguistic discrimination skills needed to differentiate between feeling bad and feeling afraid (Hoffman, 1982a). Requiring that a child report an emotion exactly matching the protagonist's may thus confound affective empathy with a child's cognitive development. Hoffman (1982a) argues that if we are interested in empathy as an affective response, all that is necessary is a rough correspondence between the participant's affect and the model's affect. Subsequent to this critique of the scoring procedure, modified scoring schemes have since then been developed (e.g. Levine & Hoffman, 1975) allowing for more general affective matches. A second criticism of the FASTE – and of other similar measures that have been used so far (e.g. Chisholm & Strayer, 1995; Strayer & Roberts, 1997), has been that their short story format might not be engaging enough to produce empathic responding in children (Eisenberg & Lennon, 1983; Hoffman, 1982a).

More recently, Bryant (1982) has developed a self-report questionnaire for the assessment of affective empathy for children, based on the Mehrabian and Epstein (1972) adult measure. The Bryant scale consists of 22 items, adapted from the adult instrument, to be more appropriate for children. These items are intended to assess affective empathy/sympathy (as questionnaire measures usually do not differentiate between the two constructs) across a variety of situations. One potential advantage of this instrument is that it allows comparison between younger and older respondents. Consequently, such an index if successful in providing valid information would be invaluable in gaining an understanding of the developmental antecedents implicated in the emergence and development of empathy. However, it seems unlikely that self-

report questionnaires tap vicarious affective responsiveness per se. For instance, not differentiating between affective empathy and sympathy, many items of the Bryant scale included items intending to tap sympathy.

In addition, both self report-questionnaires, as well as self-reports of emotional state described above, suffer from further shortcomings. For instance, the experience of vicarious affective responsiveness may be confounded with the willingness to report this response (Bryant, 1982). Self-report measures may often reflect the individual's desire to conform to gender-role stereotypes (Eisenberg & Lennon, 1983). Also, as previous investigations have shown, self-report measures appear to be vulnerable to demand characteristics (Eisenberg-Berg & Hand, 1979), and to confounding factors such as the gender of the experimenter (Eisenberg & Lennon, 1983). In fact, children have been found to score higher if interviewed by same sex experimenters (Eisenberg & Lennon, 1983). Moreover, self-report measures have been associated with indices of social desirability (e.g. Eisenberg, Miller, Schaller, Fabes, Fultz, Shell & Shea, 1989b).

With all these shortcomings, it seems unlikely that the verbal measures provide accurate information as to whether affect is aroused in the observer. Especially when assessing empathy in children, it is unlikely that children are always consciously aware of their vicarious affective arousal and/or always willing to report it.

2.6.1.2. Physiological measures of affective empathy

To tap vicariously aroused affect independently of a person's conscious experience in a way that would also be unaffected by verbal and introspective skills, by social desirability, self-presentation or demand characteristics, there is a clear need for more direct measures than verbal reports. The question is which direct measures would be unaffected by all the aforementioned factors. In the operational definition for the current thesis – as well as in most current research dimensions – affective empathy is viewed as the sharing of another's affective state. If it is accepted that emotions are underlined by physiological substrates, then in bridging the emotions of one to those of another, a basis of shared physiology is implied. Thus, autonomic

indices of directly induced affect could be used for providing evidence as to whether, and to what level of intensity, affect has been aroused in the observer.

Affective empathy and Heart Rate (HR)

HR acceleration has been associated with anxiety and active coping during stress (Cacioppo & Sandman, 1978; Lazarus, 1974). There is evidence that infants as young as 8 months of age show an increase in HR just before crying which suggests that HR acceleration is indicative of negative affect or stress (Vaughn & Sroufe, 1979). Similarly, school-aged children and adults have shown evidence of HR acceleration when they are in distress (Kagan, 1982). On the other hand, because HR deceleration has been associated with the intake of information from the environment in the psychophysiological studies (e.g. Cacioppo & Sandman, 1978; Lacey, Kagan, Lacey & Moss, 1963) it has been suggested that HR deceleration in sadness inducing context may be a marker of focus of attention to the needy other (e.g. Eisenberg, Fabes, Schaller, Carlo & Miller, 1991a).

Alternative hypotheses could therefore be made for the patterns of HR in an emotion evocative context: The observer's HR would increase due to his/her vicarious affective arousal or it would decrease because s/he is attending to an event (in this case an affective stimulus) that is external to self. Or even, HR would not be significantly altered, as the empathically aroused affect – and thus HR acceleration – would counterbalance the effect of the attention to an external stimulus – and thus HR deceleration. Or even, that the HR would initially decelerate as the observer attends to the stimulus and then would increase as a result of the vicariously induced affect.

Hoffman (1982a) puts forward two alternative possibilities for the patterns of HR in emotion evocative context: One possibility is that the answer depends on the intensity of the affective stimulus. If the intensity is low, the cognitive dimensions of empathy may predominate leading to a decrease in HR. If the intensity is high the observer's experience may be aversive leading to HR acceleration.

The second possibility is that given a low level of intensity, whether HR will accelerate or decelerate depends on the predominant mode of empathy (see section

2.3). If the most advanced cognitive modes are involved, the ones that involve imagining oneself in another's affective state, HR might be expected to decelerate. The earlier, more primitive modes, which are not mediated by cognitively inferring another' s emotional state, might lead to HR acceleration. Following this line of reasoning, it may be expected that young children's HR will accelerate in emotion evocative context, and older children's and adults HR will decelerate.

Empirical data provide some indirect support for Hoffman's predictions. There is evidence showing a slowing of HR in sadness-inducing contexts of selectively low intensity (e.g. Craig & Lowery, 1969; Eisenberg, Schaller, Fabes, Bustamante, Mathy, Shell, & Rhodes, 1988c) but also HR acceleration in distressing contexts (e.g. Calkins & Dedmon, 2000; Eisenberg *et al.*, 1991a; Eisenberg, Fabes, Bustamante, Mathy, Miller & Lindholm, 1988a; Gaertner & Dovidio, 1977). However evidence, especially for children, is not yet fully conclusive, as there have been studies reporting higher HR relative to baseline in sadness-inducing contexts of not particularly high intensity (e.g. Zahn-Waxler, Cole, Welsh & Fox, 1995).

Physiological responses in exposure to video-presented stimuli

It is reasonable to ask whether the patterns of physiological responses evident in real-life quasi-experimental simulations would be similar to those demonstrated by exposure to emotion evocative video-presented stimuli – where situations are likely to be perceived as hypothetical. Eisenberg and colleagues have taken some of the initial steps to demonstrate that emotions elicited by exposure to programming on television are analogous to those provoked by exposure to another's real life distress. Eisenberg and associates, in a systematic series of studies, have reported HR acceleration in distress segments of films, not only in studies with adults (e.g. Eisenberg *et al.*, 1991a), but also with school-aged and even with preschool children (e.g. Eisenberg *et al.*, 1988a). Similar patterns have been reported from other laboratories using video-presented stimuli (e.g. Zahn-Waxler *et al.*, 1995). Consequently, it seems that autonomic responses when exposed to video-presented emotion evocative content are analogous to those demonstrated in real-life experimental situations. Therefore, there seems to be no reason to believe that video-

presented evocative context would not produce autonomic responses analogous to those evident in real-life experimental inductions.

Can Heart Rate (HR) discriminate between emotions?

Previous research concerning autonomic specificity of differing emotional states has yielded mixed results (e.g. Averill, 1969; Ax, 1953; Roberts & Weerts, 1982; Schwartz, Weinberger & Singer, 1981; Sternbach, 1962). Early studies in the 1950s (e.g. Ax, 1953; Funkestein, King & Drolette, 1954) with adults in real-life experimental inductions have shown differences in some cardiovascular responses (e.g. diastolic blood pressure) during anger and fear, but equal increase in HR. Similarly, several investigators (e.g. Weerts & Roberts, 1976) have reported that during anger and fear imagery scenes, some cardiovascular responses differed (e.g. diastolic blood pressure) but HR increased equally. Including a greater range of emotions (i.e. fear, anger, happiness, sadness), Levenson, Ekman and colleagues, across a series of systematic studies (e.g. Ekman, Levenson & Friesen, 1983; Levenson, Carstensen, Friesen & Ekman, 1991; Levenson, Ekman & Friesen, 1990) involving constructing facial prototypes of emotion and/or relieving past emotional experiences, reported the following patterns: greater HR increase for the negative emotions of anger and fear than for the positive emotion of happiness; HR during sadness presented intermediate patterns being higher than in happiness and lower than anger and fear but not differing significantly from HR during any of these emotions (i.e. fear, anger, happiness).

Other investigators have reported a greater increase in HR during anger relative to fear, a greater increase in fear relative to happiness and a moderate increase in HR in sadness (Schwartz et al., 1981). In the single study located with children (aged 4-5 years), which involved constructing facial prototypes of emotion, Shortt and colleagues (Shortt, Bush, McCabe, Gottman & Katz, 1994) reported that HR across happiness and anger did not differ significantly.

To conclude, findings concerning HR as a marker of a range of emotions seem to be quite inconsistent (Schwartz, 1986). Yet, to our knowledge, there are no available data examining vicarious induced reactions in response to different emotions.

2.6.1.3. Facial measures of affective empathy

Given that physiological measures are spontaneous, despite their weakness (e.g. problems associated with their interpretation), at least they do not suffer from the self-presentational bias, verbal or introspective skills that influence verbal measures. Therefore, they are more likely to give more accurate information as to whether affect is aroused in the observer. Physiological measures, however, are uncomfortable for the participant as they constrain movement, and they may be upsetting particularly to children. In addition they are cumbersome to implement.

An alternative measure that may provide more direct information than the verbal indices whilst overcoming the limitations of the physiological procedures is the facial expression of emotional experience. A considerable body of research has established the universality and reliability of some facial emotional expressions (e.g. Ekman & Friesen, 1975) and inter-rater reliabilities have been consistently high (see Marcus, 1987). However, facial expressions have two important potential disadvantages. Firstly, unlike physiological indices, it is difficult to assess with accuracy the intensity of the vicarious response. Secondly, their display over the lifetime of the individual is public. Such public displays, over time, may gradually be affected by socialisation processes (e.g. they can be masked or neutralised; Shennum & Bugental, 1982). For instance, children who experience disapproval for displaying a negative emotion such anger may gradually stop expressing it. Facial displays of negative emotion have indeed been shown to become increasingly masked with age (Strayer, 1983, as cited in Strayer & Roberts 1997).

Nonetheless, because facial measures in experimental situations are usually collected in ways that make them potentially less liable to self-presentation or social desirability bias (i.e. with hidden camera), and are unaffected by verbal and cognitive skills, and do not require that the children are consciously aware of their affective state, such measures may have an edge over self-report measures of vicarious affective responsiveness.

2.6.1.4. Aim and hypotheses

The present study was designed as an in-depth investigation of the degree of agreement between verbal self-reports, facial expressions and an autonomic index of vicarious affective responsiveness (i.e. HR) in children aged 8-10, when confronted with a brief emotionally evocative film. The film depicted a single continuous story, and was therefore more realistic compared to the short story formats utilised in past investigations (e.g. Chisholm & Strayer, 1995; Strayer & Roberts, 1997), which required the child's affective state to shift rapidly from story to story. Within this single-story film, a variety of emotions (i.e. sadness, happiness, fear, anger) were depicted at various points in the story. Such a stimulus would allow an investigation of whether: **i)** autonomic indices would discriminate between vicarious responses across the different emotions, and; **ii)** the degree of agreement between autonomic, verbal and facial measures would differ across emotions.

The procedure involved children unobtrusively watching the film while their HR and facial expressions (through a hidden camera) were recorded. Immediately after viewing the film, children were asked to verbally report their vicarious affective experience across the evocative episodes. It was predicted that the facial - but not self-report measures - would provide converging evidence with the physiological index, as they are more direct measures of affect, and unlike self-report indices, are potentially unaffected by introspective and verbal skills and self-presentation bias.

A further aim of the study was to assess whether the Bryant Empathy Index questionnaire (1982), the most widely used self-report questionnaire measure of empathy for children, would provide converging information with the facial or/and the autonomic indices of vicarious affective responsiveness. On the basis of the rationale described above (i.e. the Bryant Empathy Index seems unlikely to tap vicarious affective responses per se and also liable to the weaknesses of self-report measures), it was predicted that the *Bryant Empathy Index* would not provide converging information with the facial and physiological measures.

2.6.2. Method

2.6.2.1. Participants

The study sample (N=29) comprised 15 girls and 14 boys, ranging in age from 8 to 10 (M=9.2) years. Girls and boys did not differ significantly in age. This particular age range was selected as representative of a fairly stable period in middle childhood during which cognitive developments are consolidated in concrete operations (Dworetzky, 1987) and when there is a growing interest in and ability to verbalise social cognition involving others (Selman, 1980). Therefore, this age was considered to be a useful starting point for the investigation of how physiological indices, facial expressions and verbal self-reports of vicarious affective responsiveness relate.

All participants were native English speakers of white ethnic origin and were recruited from 8 different state schools in Glasgow and surrounding areas. Parents, who responded to letters from the head teachers of their children's school regarding the study, were contacted. Once the rationale and study procedure in detail was explained, a laboratory assessment was scheduled. Written informed consent was obtained from parents with the provision that the participating child would not be informed of being videotaped, in order to minimise his/her possible self-consciousness regarding facially-expressed emotion in response to stimuli. The participating child was debriefed about the video recording at the end of the experimental session and his/her facial data were viewed only if his/her consent was obtained. No child refused permission to view the data.

2.6.2.2. Stimulus film

Procedure for selecting, editing and piloting the stimulus film: The stimulus film 'Who do you think you are' (Carlton TV, Health and Social Issues, 1992 - see Table 2.1 for description) was selected on the basis of its correspondence to the following criteria: **i)** depicting the development of a single story rather than a series of independent vignettes, as the short story format of the vignettes has been criticised for not being adequate for eliciting vicarious responding; **ii)** being suitable (e.g. judged as realistic) for the particular age group; **iii)** being short in duration, given the nature of the physiological assessments; **iv)** depicting a range of different emotions.

The film in its original form was of 22 minutes duration. To make the film shorter, segments that were not vital for the development of the story were disregarded. In its final form the film was of 8.5 minutes length. The evocative episodes to be analysed were selected with the assistance of 15 postgraduate psychology students. The 15 postgraduates were asked to watch the film and indicate the three most evocative episodes for each of the tested emotions of sadness, fear, anger and happiness. Only the episodes that raised at least 90 % or higher agreement among the judges were included in the analysis. These episodes included 3 depicting sadness, 2 anger, 2 fear and 1 happiness/surprise.

Table 2.1 Description of the Stimulus Film

Title of the film: Who do you think you are?

The film portrays Ben, a boy at the age of 11 who, as he walks across the road, watches another boy accidentally knocking down an old lady (Ms Morton). **A lady passing by, thinks that it was Ben who knocked down the old lady and she starts shouting at him that she is going to report this to the police. Ben attempts to explain her that she has got it wrong but she would not listen (1st evocative episode, predominant emotion depicted: anger).**

Ben, disappointed, goes home where his mother tells him that his father with whom she recently divorced will be working again this weekend and he will not be able to see him. Ben's father, working as a lorry driver, is away a lot and he rarely sees Ben. Especially after he got divorced and he does not stay at home any more. **Ben, obviously upset, goes to his room where he looks at an old picture of his family being together; he lies on his bed and he is staring at the picture remembering his dad. (2nd evocative episode, predominant emotion depicted: sadness).**

Ms Morton, the lady who was knocked down phones Ben's mother, telling her that she had a nasty fall and asks her if Ben is at home. Ben's mother hangs up in a hurry as she misunderstands that it was Ben who knocked down Ms Morton. Ms Morton did not have the chance to explain that the reason she phoned was to ask Ben whether he has seen Tiger. Tiger is her cat which she was holding in her arms when she fell and he ran away just after her fall. Ben's mother then goes to his room and she starts shouting at him as she thinks that it was Ben who did it. Ben, obviously annoyed, shouts back saying that none of them seems to understand him. **Ben's mother being very annoyed with her son's reaction keeps shouting, telling him that it is not her fault that he does not see his dad often, and he is not going to take it out on her. (3rd evocative episode, predominant emotion depicted: anger).** She tells him that he will stay in his room until he calms down and she leaves the room.

Ben opens his window and runs away. He tries to call his dad, but he does not manage to find him. Being disappointed, he runs without knowing where he is going. Suddenly he hears a cat; he looks back and he sees Tiger, Ms Morton's cat. Ben catches Tiger. He is ready to take it back home when suddenly a strong storm starts and the cat frighten jumps out of his hands. **Ben, running after Tiger enters a cemetery. He runs across the**

42

graves, it's thundering and lighting; a very loud clap of thunder is heard and old glass is heard smashing. Ben is scared (4th evocative episode, predominant emotion depicted: fear).

Ben manages to catch Tiger and he takes him home. Ms Morton welcomes and thanks Ben. The heavy storm still continues and Ms Morton tells Ben to stay for a while until the storm calms down. She tells him to take a warm shower and change his wet clothes. **When Ben gets in the shower and tries to increase the volume of water the flame from the old shower gets suddenly much bigger and Ben gets frightened (5th evocative episode, predominant emotion depicted: fear).** He soon calms down, decreases the volume of water and the flame gets smaller.

Once Ben finishes, Ms Morton tells him that she phoned his mum so she would not be worried. She then tells him that his mum is always talking about him and she loves him a lot. Ms Morton then tells him that she knows he does not see his dad much but he is lucky to have a dad. He has got the telephone and he can talk to him whenever he likes. **Ms Morton starts talking about her own dad, telling him that she did not have the chance to meet him. He was a pilot and he was killed in the second world war (6th evocative episode, predominant emotion depicted: sadness).**

Ben prompted by Ms Morton talks about his own dad. **He tells her that his dad is a lorry driver and he has to travel a lot. His mother did not like it that he was away for so long and they split up. He is away all the time now though. (7th evocative episode, predominant emotion depicted: sadness)** Ms Morton tells him that they did what was best for them; and for him too. He has got the telephone and he can talk to his dad whenever he feels he needs it. She then asks him when he last talked to him. Ben complains that he tried many times this afternoon but he was never there. Ms Morton prompts him to call just now. Due to his discussion with Ms Morton, Ben feels much better and he tries to phone to his dad. He manages to speak to him and with surprise **he learns from his dad that he has got a new job and he is going to be seeing him much more often now (Segment 8, predominant emotion depicted: happiness/surprise).**

Source of the film: Carlton Television (1982) Health and Social Issues

2.6.2.3. Measures

Facial expressions of emotions:

Children's facial expressions while watching the film were videotaped for subsequent coding in terms of the presence of the specific emotional states of anger, sadness, fear and happiness/surprise. The criteria for identifying the facial reaction were based on the AFFEX System developed by Izard, Dougherty and Hembree (1983, see section 2.6.2.7).

Heart Rate (HR):

Electrocardiogram (ECG) data were collected every 15 milliseconds while watching the film, and recorded online into a computer for subsequent computing of HR.

Verbal self-report of emotion:

Following viewing of the entire film, verbal self-reported emotional reactions to each of the pre-selected evocative episodes (depicting anger, fear, sadness, happiness/surprise) were obtained.

Bryant Empathy Index for Children and Adolescents (Bryant, 1982):

The *Bryant Empathy Index for Children and Adolèscents* (Bryant, 1982) derived from the Mehrabian and Epstein (1972) empathy measure for adults. This instrument is a 22-item questionnaire that requires young children to agree or disagree with a series of statements read by the examiner (e.g. seeing a boy who is crying makes me feel like crying' (see Appendix 2).

2.6.2.4. Experimental setting, materials and equipment

For the laboratory assessment, three adjacent experimental rooms at the university laboratory were used: a control room, observation laboratory and psychophysiology laboratory (see Appendix 9 for illustration of the setting).

Control room: In the first room, a videocamera behind a one-way mirror was used for the recording of the facial expressions of each participating child. A child would be seated in the adjacent room (observation laboratory), facing a TV screen. The videocamera was connected to: i) split-image mixing equipment, which mixed and displayed on a TV monitor the facial expressions of the child in one half of the screen and the development of the movie in the other half, and; ii) a VCR recording the displayed split image.

Observation laboratory: The middle room was equipped with a comfortable armchair on which the child was seated and a TV screen (situated in front of the one-way mirror so facial expressions of the child would be monitored from the camera in the control room) through which the stimulus film was presented to the child. No equipment required to be operated at the beginning or during the experimental session in this laboratory. This avoided disrupting the child's attention which may have negatively influenced the physiological assessments.

Psychophysiological laboratory: On the other side of the observation laboratory, the psychophysiological laboratory was equipped with a computer-based acquiring system (*MP100SW*) including both hardware and software designed for the acquisition and analysis of psychophysiological data. The hardware included the *MP100A Data Acquisition Unit*, the function of which was to receive incoming signals and convert them into digital signals to be processed by the computer. The *MP100A* unit was connected onto a computer via a *Biopac ISA 100A* card installed on a free expansion slot of the computer. This was an ISA architecture serial interface card that allows for high-speed communications between the *MP100A* unit and the computer at a minimum rate of 500,000 BPS (Beats Per Second). The *MP100SW* system also included a Universal Interface Module *(UIM100A)* that was connected to the *MP100A* unit via 1 analog and 1 digital cable. The purpose of the UIM was to function as an interface between the *MP100A* unit and the external amplifier module. The amplifier used in the present study was the *ECG100-Electrocardiogram Module*. The gain of the *ECG100* was set at 40mV. For the ECG recording, the *ECG100* was connected to *LEAD100S* set of electrodes designed for ECG recordings.

The *Acknowledge 3.5.3 (Biopac Systems, Inc.)* software was used in conjunction with the *MP100WSW* System. This software is designed to integrate measurement data and display them as waveforms into user-defined channels. It also performs various transformations on the acquired data.

In short, the procedure for the Electrocardiogram (ECG) recording was as follows: the *LEAD100S* would channel all signals to the *ECG100* amplifier attached to the *UIM100A*. In turn, the UIM100A would feed the signals to the MP100A unit, which would convert them into digital inputs and send them to the *Biopac ISA100A* card. At this point, the data would be integrated and stored in the *Acknowledge 3.5.3* software for later analysis.

As it was considered important that each participating child was able to watch the film without distraction, so that the physiological and facial reactions would be affected to the least possible degree by extraneous factors, the presentation of the stimulus film was controlled from the psychophysiological laboratory. Therefore,

this laboratory was also equipped with a VCR and a TV screen connected to the monitor in the observation room. For preciseness in the coding of the physiological responses, the recording of the ECG and the GSR were synchronised to the onset of the video stimulus. This was achieved by the following procedure: At the beginning of the stimulus video and 10 seconds before the start of the film, an audio tone was placed on the second channel of the VCR. The VCR was connected to specially designed equipment for transforming the audio tone into a digital input, which was connected to one channel of the acquiring equipment for triggering the acquisition. With this procedure, 10 seconds after pressing the start button of the VCR (in the laboratory), an audio tone would be presented that would trigger the acquiring equipment. Then 10 seconds after that, the stimulus film would be presented simultaneously in the psychophysiology laboratory and in the observation room.

2.6.2.5. Procedures

Piloting the procedures

The laboratory assessments were initially piloted with 20 adults so the investigator would gain adequate experience for easier implementation of the physiological procedures with children. Subsequently, procedures were piloted with 4 children.

Experimental session

Participants were tested individually in a single laboratory session of around 45 minutes duration in a university laboratory.

i) Preparation of the experimental setting on the day of testing:

An hour prior to the arrival of each participating child accompanied by his/her guardian at the laboratory, the recording equipment was calibrated. The equipment transforming the audio tone into digital input was connected to the recording equipment and to the VCR, which in turn was connected to the TV monitors in the observation and in the psychophysiology laboratories.

ii) Laboratory assessment: Assessment of facial expressions and Heart Rate (HR)

Upon arrival of each participating child accompanied by his/her parent/guardian, s/he was familiarised with the setting and the experimenter and then escorted to the observation laboratory. The procedure of the experiment was explained, the function of the physiological equipment was introduced and the child's consent to proceed was obtained. The child's consent for using videorecording of facial data would be sought after the experimental session was completed. The rationale of the experiment, and the procedure in detail had previously been explained to the parent and his/her consent was obtained.

The participating child was then seated in a comfortable chair approximately 6 feet from the television screen. After the child's skin had been lightly abraded and cleaned with Skin Pure *(Nihon Kohden Corporation)* for reduction of the impedance of skin surface areas, the electrocardiograms *(ECG)* electrodes were attached to the child. Three small-prejelled electrocardiogram *(ECG)* electrodes were attached in an inverted triangle pattern on the child's non-dominant hand and legs. In accordance with the *Acknowledge* users manual, the first electrode was attached on the non-dominant hand, the second on the opposite leg across and a third one, which served as a ground, was placed on the other leg (illustrated in figure 2.1). The ECG Signals were transmitted to the adjacent psychophysiology laboratory, amplified, displayed and recorded onto one channel of the instrumentation recorder for later analysis.
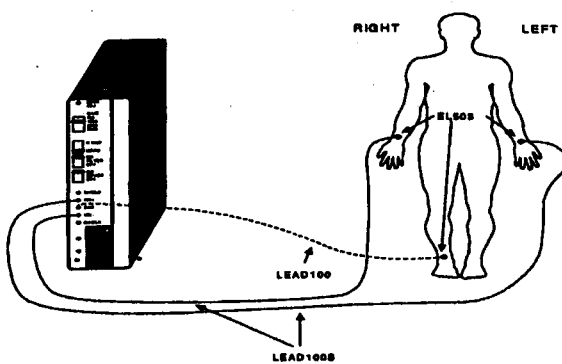
Figure 2.1. Illustration of the ECG electrodes attachment

Once the electrodes were attached to the child, s/he was requested to limit movement as far as possible during the procedure. S/he was assured that both the guardian and

the investigator would be nearby if needed and was then left alone to watch the film. The guardian was accompanied to the psychophysiology laboratory where s/he stayed throughout the experimental session. The investigator then started the VCR in the control laboratory to record the facial expressions of the child and, immediately after, started the VCR in the psychophysiology laboratory. The latter VCR was connected to the TV monitor in the observation room where the child watched the stimulus film alone and without interruption while his/her ECG and facial expressions (by a hidden camera in the control room) were recorded. Sole viewing of the film was thought necessary to decrease any social demands that might attenuate the child's facial expressions (Yarczowen & Daruns, 1982).

The investigator, with the child's guardian in the psychophysiology laboratory, watched the film from the TV monitor and did not enter the observation laboratory until immediately after the stimulus film was completed.

Assessment of verbal self-report of emotion

Immediately after watching the film, each child was asked to verbally indicate how s/he felt while watching each of the preselected emotion evocative episodes depicting anger, fear, sadness, and happiness/surprise. To minimise memory requirements, following the viewing of the entire film, each participating child watched a brief section (5 seconds) of each of the preselected 8 evocative episodes in the order in which the episodes occurred. Immediately after watching each episode, the child reported how s/he felt when s/he watched that particular episode. If an answer other than 'OK' or 'fine' was reported, a follow-up explanation was asked for. If a child reported that s/he felt bad or good s/he was asked to clarify what the emotion 'bad' or 'good' was most like, resulting in a clear statement of a particular emotion.

Administration of the *Bryant Empathy Index* (1982)

At the same session, each participating child was also administered the *Bryant Empathy Index* (Bryant, 1982). The 22 items of the questionnaire were read aloud and the child responded verbally, indicating whether the statement was 'like me' or 'not like me'. In the event of difficulty, questions were re-read a maximum of three times.

The order of the administration of i) the *Bryant Empathy Index* and; ii) the laboratory assessment followed by the verbal report of emotion was counterbalanced across participants.

Once the session was finished, the child was debriefed in relation to the video recording of his/her facial expressions. The rationale of not being informed in advance was explained and his/her permission for viewing the recording was asked. It was clarified that the video recording would only be viewed for the sole purposes of the study and only if s/he would give his/her consent. No child refused the viewing of his/her recording.

2.6.2.6. Data Coding / Scoring/Analysis

Analysis of Heart Rate (HR)

The data files were edited using the *Acknowledge 3.5.3* software. Editing the files consisted of scanning the data for outlier points relative to adjacent data, and replacing these points with the average of the codable beat immediately before and after the outlier.

With the use of *Acknowledge 3.5.3* software, from the acquired ECG data (sampled every 15 milliseconds), HR (in Beats Per Minute, BPM) was computed. Data were then extracted to Excel data files, where mean HR (BPM) for the baseline period and the preselected evocative episodes was computed.

The film started with 90 seconds of neutral content. Baseline HR was obtained for each child using: i) the last 20 seconds of this neutral content, where Ben, the 11 year-old film protagonist, is depicted walking along the road and; ii) the last 10 seconds in the end of the film, when the film is completed and a starfield is presented. Baseline HR (averaged across the baseline at the beginning and end of the film) was compared to the average HR across each type of evocative episode (sadness, fear, anger, happiness/surprise; see table 2.2).

Table 2.2. Evocative episodes for which HR was analysed

Type of evocative episode	Description/duration of the evocative episode
Anger	Episode 1: 13 seconds segment when a woman is shouting at Ben for knocking down the old lady (Ms Morton) when it was actually not him who did it.
Sadness	Episode 2: the 9 seconds segment when Ben is looking at the photo of his family being together before his parents' divorce.
Anger	Episode 3: 12 seconds segment when Ben's mother is shouting at him after she receives a phone call from Ms Morton and she misunderstands that it was Ben who knocked her down.
Fear	Episode 4: the 14 seconds segment when Ben is out in a very heavy storm and trying to catch Tiger, Ms Morton's cat gets in a cemetery. It's lighting and thundering and old glass is heard smashing.
Fear	Episode 5: the 6 seconds segment when Ben is taking his shower in the old lady's house, he increases the volume of water and the flames suddenly spring up from the old shower.
Sadness	Episode 6: the 12 seconds segment when Ms Morton talks about her own dad whom she never met as he was killed in the second world war.
Sadness.	Episode 7: the 11 seconds segment when Ben talks about his parents' divorce.
Happiness/surprise	Episode 8: the 8 seconds segment when Ben manages to speak to his dad, learning that he has got a new job and so he will now be able to see him more often.

Coding of the facial expressions

Facial expressions, recorded whilst watching the 8 emotion evocative episodes, were coded from each child's videotape. A two-minute baseline tape for each child was viewed initially to familiarise the coder with any idiosyncratic facial characteristics. The coder judged the child's predominant facial expression during each of the evocative episode. Details of coding criteria are given in table 2.3.

Coding was based on AFFEX facial coding system developed by Izard *et al*, (1983). AFFEX considers only those facial movements that indicate affect, unlike other systems designed to code all facial movements (Ekman & Friesen, 1975) Therefore,

it was considered to be more efficient and less labour intensive for addressing the concerns of the present study. AFFEX was developed from the original MAX coding system (Izard, 1979) in which facial movements are coded separately for three major facial regions reviewed sequentially. With AFFEX, coders simultaneously code the three facial regions. AFFEX is able to identify eight fundamental emotional expressions (interest, joy, surprise, sadness, anger, disgust, contempt, fear) and can be used in testing from infancy through adulthood (Izard *et al.*, 1983).

The facial data were scored by a coder trained for reliability on AFFEX (Izard *et al.*, 1983). The coder was blind to the hypothesis being generated. The data of 8 children were randomly selected and checked for reliability by a second coder also trained for reliability on AFFEX. The overall inter-coder agreement was calculated using the weighted Kappa procedure. The average Kappa was 0.75 ranging from 0.88 for happiness to 0.72 for sadness.

Table 2.3 Description of AFFEX Facial Emotion Codes

Emotion	Description
Happiness	Forehead smooth; cheeks raised; corners of mouth drawn back and up
Sadness	Inner brows drawn together, vertical furrows or bulge between brows; raised inner corners of upper eyelid; eyes squinted; downward mouth corners; lower lip pushed upward by chin muscle (chin puckers)
Anger	Brows sharply down and together; vertical furrows or bulge between brows; nasal root broadened or bulged; eyes narrowed by lowering of brow; rectangular mouth; lips may be pressed together tightly.
Fear	Straight brows slightly raised and drawn together; horizontal lines or bulge on forehead; nasal root narrowed; eyes narrowed or squinted; eyelids raised (white shows more than usual) mouth corners tight or retracted.
Surprise	Brows raised, bulging or long furrows completely across forehead; mouth open oval or roundish
Neutral	Expression as baseline. Includes both 'no expression' and 'no clearly identified emotion'

Note: Descriptions are based on Izard, Dougherty and Hembree (1983).

To derive a score for facially-displayed affective empathy, the number of times across the 8 evocative episodes that the child displayed an emotion (either matching

the protagonists or being of similar valence) was added to derive a score ranging from 0-8.

Coding of the self-report data

Self-reported emotion for each evocative episode was coded by the investigator. Each elicited response was coded categorically as **i)** an exact match to the protagonist's emotion; **ii)** similar valence between participant's self-reported emotion and protagonist's emotion; **iii)** no emotion or; **iv)** discordant (opposite) emotion reported by the child.

A random sample of the data of 8 children was checked for reliability by a second coder. The inter-coder agreement was calculated using the weighted Kappa procedure. The average Kappa was 0.92.

To derive a score for self-reported affective empathy, individual scores across the 8 evocative episodes were added together. For each episode, a score of 0 denoted no emotion or discordant (opposite valence) emotion. A score of 1 was allocated for an exact match or of equal valence emotion. In this way, for each child, a score ranging from 0-8 was derived.

Scoring the *Bryant Empathy Index* (1982)

On each of the 22 items empathic responses scored 1 and non-empathic responses scored 0 raising a maximum potential score of 22.

2.6.3. Results

2.6.3.1. Statistical analysis

Descriptive Statistics: For data that were normally distributed, and for which the equality of variance assumption was met, Mean scores and Standard Deviations (SD) are presented. For data that were not normally distributed, and /or for which the equality of variance assumption was violated, Median scores and the Interquartile Range (IQR) are presented.

Inferential Statistics: For the data that were normally distributed and the equality of variance assumption was met, the within-subject difference for two-sample data was determined by using related t-tests. The between-subject difference for two-sample data was determined by independent t-tests. For the data that were highly skewed, or for which there was a marked heterogeneity of variance, non-parametric tests, which assume neither homogeneity of variance nor a normal distribution, were employed. Between-subject differences for two-sample data were determined using the Mann-Whitney U test. Within-subject differences were determined using the Friedman test or the Wilcoxon Matched-Pairs Signed-Ranks test for two-sample data. Degree of agreement across two measures was determined with the use of Cohen's Kappa chance-corrected statistic (Cohen, 1960). Correlations for non-parametric data on one or both variables were determined by the use of Spearman's rho.

Table 2.4. Outline of the statistical tests used for the main hypotheses

Examined relationship	Statistic
Effect of type of episode (baseline, sadness, fear, anger, happiness/surprise) on HR	Friedman (followed by Wilcoxon Signed-Ranks test for pairwise comparisons)
Effect of gender on HR in each type of episode (baseline, sadness, fear, anger and happiness/surprise)	Mann-Whitney U
Effect of gender on Bryant Empathy Index score	Independent t-test
Convergence between facial and physiological (i.e. HR) measures in response to emotion evocative episodes	Cohen's Kappa chance-corrected (Cohen, 1960)
Convergence between facial and verbal measures in response to emotion evocative episodes	Cohen's Kappa chance-corrected (Cohen, 1960)
Convergence between physiological and verbal measures in response to emotion evocative episodes	Cohen's Kappa chance-corrected (Cohen, 1960)
Convergence between Bryant Empathy Index score and facial/physiological measures	Spearman's rho correlation

2.6.3.2. Physiological (Heart Rate) responses

HR (averaged across each type of episode, see section 2.6.2.7.) was analysed across baseline and during exposure to the series of evocative episodes (i.e. sadness, fear,

anger and happiness/surprise) of the brief film. Descriptive statistics and skewness for the HR during baseline and during exposure to each type of evocative episode are presented in table 2.5. As illustrated in Figure 2.1, HR appears to be higher during the evocative episodes relative to baseline. HR is higher in the exposure to the protagonist's fear followed by exposure to the protagonist's happiness/surprise, anger and sadness.

Table 2.5. Descriptive statistics and skewness for HR (in BPM) at baseline and during the evocative episodes

Type of episode	Median	IQR	Skewness (S.E.S)
Baseline	82.95	15	1.797 (0.434)
Happiness/surprise	85.53	19.57	1.746 (0.434)
Sadness	83.66	12.77	2.460 (0.434)
Anger	84.91	16.33	2.034 (0.434)
Fear	86.06	20.24	1.905 (0.434)

IQR: Inter-quartile range, S.E.S : Standard Error of Skewness
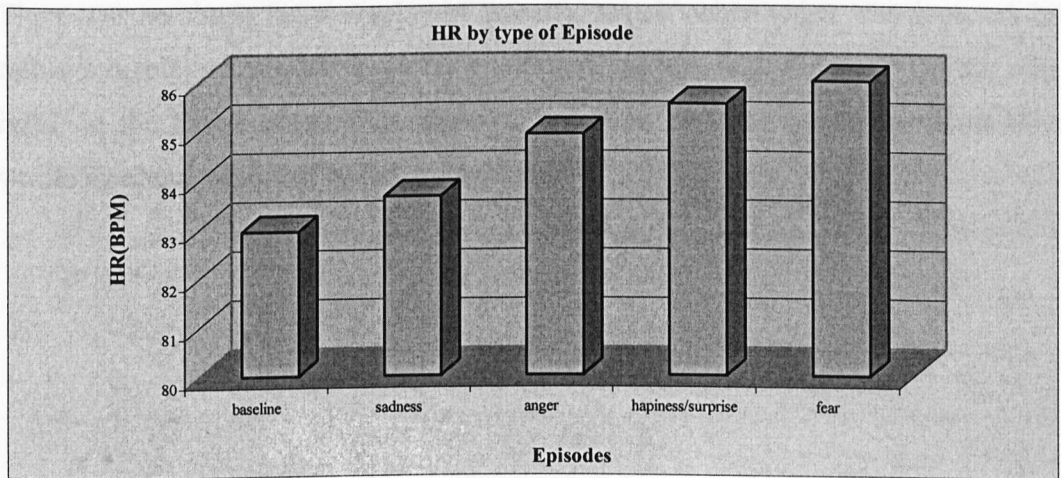
Figure 2.2. Patterns of HR across baseline and evocative episodes

A Friedman test performed on HR data across the four types of episodes (baseline, sadness, anger, fear, happiness/surprise) revealed a statistically significant effect of the type of episode ($x^2 = 13.655$, df = 4, p<0.008). Following the significant effect

of the type of episode, pairwise comparisons using Wilcoxon Signed-Ranks Tests revealed the following patterns: HR was significantly higher relative to baseline in exposure to the protagonist's fear (z = 2.843, N-ties = 29, p<0.004), anger (z = 2.043, N-ties = 29, p<0.041), sadness (z = 2.000, N-ties = 29, p<0.045) and happiness (z =2.822, N-ties = 29, p<0.005). HR was also significantly higher in exposure to the protagonist's fear relative to exposure to the protagonist's anger (z = 2.087, N-ties = 29, p<0.037). Separate Mann-Whitney U tests employed to determine gender effects on HR across the evocative episodes did not reveal a significant effect of gender on HR in any of the episodes.

2.6.3.3. Facial and verbal responses

i) Descriptive data of facially expressed and verbally-reported affective empathy

As shown in Table 2.6, when children reported a vicariously induced emotion, this emotion was typically consistent, but not always exactly matching, with the emotion displayed by the stimulus character. Likewise, Table 2.7 shows that, in line with verbal reports, facially-displayed emotions were also consistent but not always identical with the emotion displayed by the stimulus character. Unlike the verbal reports, however, the facial data present differentiated patterns across emotions. There was no single facial display of 'specific match' when anger was depicted, but rather a display of another negative emotional reaction (e.g. sadness). On the other hand, in the happiness/surprise segment, when an emotion would be displayed it would be identical to that of the protagonist.

Table 2.6. Verbally-reported emotions during the protagonist's differing emotional states

Emotion displayed by film protagonist	Exact match	Valence match	No emotion	Mismatch
Anger (2 episodes)	10	21	27	0
Sadness (3 episodes)	46	7	34	0
Fear (2 episodes)	16	16	26	0
Happiness/surprise (1 episode)	20	2	7	0
Total	92	45	93	0

Numbers on the table indicate the frequency in which responses were elicited across the 8 evocative episodes across the 29 participating children. Exact match: reported emotion matching to the protagonist's emotion; valence match: reported emotion of equal valence but not identical to the protagonist's emotion; no emotion: no vicarious response reported; mismatch: emotion reported of opposite valence to the protagonist's emotion

Table 2.7. Facially-displayed emotions during the protagonist's differing emotional states

Emotion displayed by film protagonist	Exact match	Valence match	No emotion	Mismatch
Anger (2 episodes)	0	34	24	0
Sadness (3 episodes)	44	11	32	1
Fear (2 episodes)	16	11	31	0
Happiness/surprise (1 episode)	10	0	19	0
Total	70	56	106	1

Numbers on the table indicate the frequency in which responses were elicited across the 8 evocative episodes across the 29 participating children. Exact match: displayed emotion matching to the protagonist's emotion; valence match: displayed emotion of equal valence but not identical to the protagonist's emotion; no emotion: no emotion displayed; mismatch: emotion displayed of opposite valence to the protagonist's emotion

ii) Did children have higher scores on verbally-reported or facially-displayed affective empathy?

The Wilcoxon Matched Pairs Signed-Ranks test was employed to determine whether children's cumulative scores (in the procedure described in section 2.6.2.7) on verbally-reported and facially-displayed affective empathy across the 8 evocative episodes differed. Skewness for children's cumulative scores on verbally-reported

affective empathy was -0.675 (0.434) and skewness for facially-displayed empathy was −0.406 (0.434). Children had higher scores on verbally-reported rather than facially-displayed affective empathy but differences did not reach statistical significance.

Did girls differ from boys on their a) facially-displayed, b) verbally- reported affective empathy; and on their (c) *Bryant Empathy Index* scores?

Two separate Mann-Whitney U tests were employed to determine whether boys and girls differed in their cumulative scores across the 8 evocative episodes (see section 2.6.2.7) on verbally-reported and facially-displayed affective empathy. Girls had higher cumulative scores than boys on both verbally-reported and facially-displayed affective empathy, but the differences were not significant. Data on the Bryant Empathy Index for both girls and boys were normally distributed. Girls had higher scores than boys on the *Bryant Empathy Index* but the difference was not significant.

2.6.3.4. Convergence of physiological, facial and verbal measures of affective empathy

This section is organised into four parts. The first three parts examine convergence of physiological, facial and verbal measures of vicarious affective responsiveness during exposure to 8 evocative episodes of a brief film: i) the first part focuses on the convergence of physiological and facial measures; ii) the second part focuses on the convergence of physiological and verbal self-report measures; iii) the third part focuses on the convergence of facial and verbal self-report measures. The final part of the current section examines interrelations of the *Bryant Empathy Index* with: a) facial, and; b) physiological measures.

Given that, for the purposes of the current study, it was important to determine whether physiological, facial and verbal measures would provide analogous information across each particular evocative episode, Cohen's Kappa chance-corrected (Cohen, 1960) statistic was employed for assessing the degree of agreement between the measures. Two different sets of analyses were conducted: Firstly, contingency tables including all the data of the two indices involved in each case were used. Secondly, to further investigate whether the degree of agreement

would differ across emotions, contingency tables for each emotion category were used. For both these analyses, initially the agreement of the measures was determined without discriminating between the genders. Subsequently, to determine whether agreement would differ across the genders, contingency tables for the data of each gender were prepared and separate kappa co-efficients were computed.

For conducting Kappa co-efficients, any facial expression of emotion (of equal valence but not necessarily matching the protagonist's emotion - see section 2.6.2.7), was taken as a facially-displayed vicarious response. In analogous fashion, any verbal response indicative of a vicarious affective response (again not necessarily matching the protagonist's affective state, see section 2.6.2.7) was taken as verbally-reported vicarious responsiveness. For HR data, significant responses were determined by the following procedure: HR individual change scores were computed for each participant for each segment by subtracting 'baseline HR' from 'HR during each evocative episode'. Significant responses were considered to be those that raised HR change higher than the median 'effect size' of HR change in that particular episode.

i) Convergence of physiological and facial measures

As shown in Table 2.8 there was a statistically significant, but low convergence over facial and physiological measures. Across 232 comparisons (29 children, 8 episodes), agreement between physiological and facial measures was 65 %, Kappa = 0.30, $p < 0.001$. Across genders, Kappa co-efficients revealed low convergence in both girls (67%, Kappa=0.34, $p < 0.001$) and boys (63%, Kappa= 0.27, $p < 0.01$).

Table 2.8. Convergence between physiological and facial measures

Response type	Emotion displayed by film protagonist			
	Anger (2 episodes)	Sadness (3 episodes)	Fear (2 episodes)	Happiness/ surprise (1 episode)
Facial/physiological response	21	35	18	7
No response	18	23	20	9
Only facial response	13	20	9	3
Only physiological response	6	9	11	10

The low concordance achieved by the present response data across the two measures is further supported by the individual kappa coefficients for each emotion category. Convergence above chance occurred for vicarious responsiveness to the protagonist's anger (67%, Kappa $= 0.35$, $p < 0.01$), sadness (67 % Kappa $= 0.33$ $p < 0.01$), fear (66% Kappa $= 0.31$, $p < 0.05$). In contrast, the two measures converged only at chance levels in response to the protagonist's happiness (55%, Kappa $= 0.15$, n.s.)

Across emotions, there was low agreement on the two measures for girls and boys in vicarious responsiveness to another's sadness, anger and happiness, but fear revealed distinct patterns. In response to the protagonist's anger, agreement was 67%, (Kappa $= 0.38$, $p < 0.05$) for girls and 68% (Kappa $= 0.36$, n.s.) for boys. In response to the protagonist's sadness, agreement was 64 %, (Kappa $= 0.28$, $p < 0.05$) for girls and 69% (Kappa $= 0.38$, $p < 0.05$) for boys. In response to the protagonist's happiness/surprise, agreement in girls was 60%, Kappa $= 0.22$, n.s.), and in boys 50% (Kappa $= 0.04$ n.s.). In response to the protagonist's fear, the patterns of results differed for girls and boys. In girls, agreement of the two measures was 73% (Kappa $= 0.47$, $p < 0.05$), while in boys agreement was 57%, (Kappa $= 0.14$, n.s.).

ii) Convergence of physiological and verbal measures

As shown in Table 2.9, physiological and verbal measures converged only at chance levels. (46%, Kappa $= -0.09$.n.s.). The separate kappa-coefficients for each gender

revealed low convergence for both girls (42%, Kappa = -0.15 n.s) and boys (50%, Kappa = -0.00 n.s.)

Table 2. 9. Convergence between physiological and verbal measures

Response type	Emotion displayed by film protagonist			
	Anger (2 episodes)	Sadness (3 episodes)	Fear (2 episodes)	Happiness/ surprise (1 episode)
Physiological/verbal response	13	25	13	13
No response	13	15	11	3
Only physiological response	14	19	16	4
Only verbal response	18	28	18	9

Low convergence across the two measures is further supported by the individual kappa coefficients for each emotion category. Agreement at chance levels occurred for sadness (46%, Kappa = -0.08. n.s), fear (41%, Kappa = -0.17 n.s) and happiness (55%, Kappa = 0.02 n.s).

Across the emotion categories, convergence was low for both genders. For vicarious responsiveness to another's sadness, agreement for girls was 44% (Kappa = -0.12 n.s) and for boys 48% (Kappa = -0.05, n.s). For fear, agreement for girls was 40% (Kappa = -0.20, n.s) and for boys 43% (Kappa = -0.14, n.s.). For happiness, agreement was 53% (Kappa = 0.02 n.s) and in boys 57%, Kappa = 0.07, n.s).

iii) Convergence of facial and verbal self-report measures

As shown in Table 2.10, there was a statistically significant, but low convergence over facial and verbal measures. Across 232 comparisons (29 children, 8 segments), agreement between verbally-reported and facially-displayed vicarious responsiveness was 62% (Kappa = 0.22, p < 0.01). A surprising gender difference was evident in the degree of agreement. While convergence for girls was at chance levels (51%, Kappa = -0.05, n.s), convergence for boys was moderate (73%, Kappa = 0.46, p < 0.001).

Table 2.10. Convergence between facial and verbal measures

Response type	Emotion displayed by film protagonist			
	Anger (2 episodes)	Sadness (3 episodes)	Fear (2 episodes)	Happiness/ surprise (1 episode)
Facial/verbal response	22	37	18	10
No response	9	16	23	7
Only facial response	12	18	9	0
Only verbal response	9	16	13	12

The separate kappa co-efficients for each emotion category revealed different patterns of agreement across emotions. Convergence above chance but at low degree occurred in anger (64%, Kappa = 0.27, $p < 0.05$) and happiness (59%, Kappa = 0.29, $p < 0.05$). In contrast, the two measures converged only at chance levels for sadness (61%, Kappa = 0.17, n.s) and fear (62%, Kappa = 0.24, n.s.).

Across emotion categories, agreement on the two measures for girls and boys revealed a distinct pattern of results. For anger, agreement between verbally-reported and facially-displayed vicarious responsiveness was 75% (Kappa = 0.50, $p < 0.01$), for boys, while for girls it was only at chance levels (53 %, Kappa = 0.00, n.s.). Similarly, for fear, agreement was 79% for boys (Kappa = 0.56, $p < 0.01$), and at chance levels for girls (47%, Kappa = -0.07 n.s.). For happiness, observed agreement was only 40% (Kappa = 0.11, n.s) for girls, while for boys it was 79% (Kappa = 0.59, $p < 0.05$). In sadness, agreement was 56% (Kappa = -0.03 n.s) for girls and 67% (Kappa = 0.33 $p < 0.05$) for boys.

Although low to moderate rather than strong concordance is emphasised, children's facial displays and verbal reports were very rarely inconsistent. In only a single case (1/232, 0.43%) of the cases across all responses did children facially express a positive emotion when they reported having felt a negative emotion. This 'rogue' case was not absolutely clear as the particular child first facially-displayed happiness (in response to another's sadness) but inspection of the facial data had shown that

few seconds later, as the film developed, he expressed sadness. There was not a single case when a child reported a positive emotion and facially expressed a negative emotion.

iv) Convergence of *Bryant Empathy Index* with physiological and facial measures

Spearman's rho correlations calculated for the individual Bryant Empathy Index questionnaire score, with the cumulative score across the 8 segments of facially-expressed vicarious affective responsiveness (see section 2.6.2.7), indicated no significant correlation. Separate analyses for each gender revealed no significant correlation either for girls or for boys.

Spearman's Rho correlations calculated for children's Bryant Empathy Index questionnaire score with their cumulative score on physiological measures, as indicated by the frequency in which significant alteration (determined in the procedure described above in the current section) of HR was observed across the 8 evocative episodes, indicated no significant correlation. Moreover, the separate correlational designs for each gender did not reveal significant correlation between the *Bryant Empathy Index* and the physiological measures, either for girls or for boys.

2.6.4. Discussion

2.6.4.1. Summary of the results

Present findings appear to highlight the necessity of distinguishing between facial, verbal, and physiological measures of affective empathy. Agreement between autonomic and verbal measures was at chance levels. Agreement between autonomic and facial measures was moderate as was agreement between facial and verbal measures. These results strongly indicate that the verbal, facial and physiological measures of affective empathy cannot be used interchangeably. Thus, generalisation of results across methods should be used with great caution, if at all.

2.6.4.2. Affective empathy and physiological responses (Heart Rate)

In line with numerous previous investigations (Calkins & Dedmon, 2000; Eisenberg et al., 1991a; Eisenberg et al., 1988a; Gaertner & Dovidio, 1977) HR was found to be significantly higher relative to baseline in response to another's fear/distress. Present findings also suggest that HR is vicariously increased in response to another's anger, and happiness/surprise. Present findings have further shown higher HR in response to another's sadness, a finding which concurs with several other investigations (e.g. Zahn-Waxler et al., 1995) but has not been well documented across investigators. In fact, the higher HR in response to another's sadness in the present study contradicts empirical findings coming mainly from the laboratory of Eisenberg and colleagues. Across a systematic series of studies, Eisenberg and colleagues have reached the conclusion that, in sadness inducing contexts, HR deceleration is indicative of sympathy resulting from an empathic reaction not only in adults but also in children (e.g. Eisenberg, 1988c; Eisenberg et al., 1988a; Eisenberg et al., 1991a; Eisenberg, McCreath & Ahn, 1988b; Kutina & Fisher, 1977; Schwartz et al., 1981).

Nevertheless, there are at least two explanations for the discrepancies between the series of studies by Eisenberg and associates, and the present one. One explanation is the intensity of the stimulus. Eisenberg and associates (op cit), in reporting HR acceleration in fear segments and deceleration in sadness - inducing segments, also reported that their experimental context was one that would not create extreme levels of sadness (Eisenberg, Fabes, Miller, Fultz, Shell, Mathy & Reno, 1989a). However, in the present study, the sad episodes (in which the HR was higher relative to baseline) were moderate to aversive. The intensity of the stimulus might have been decisive for the patterns of HR. Hoffman (1982a) suggests that when the intensity is high, as it was in the present study, the affective dimensions of empathy may dominate over the cognitive, and consequently HR will increase. Whereas when the intensity is low, as it has been in Eisenberg's studies, cognitive dimensions that involve imagining one-self in another's situation may predominate. In which case it would be expected that HR deceleration that has been associated with the focus of attention to the sad or distressed other would be evident. Hoffman (1982), however, further suggests that, specifically in children (especially in the younger ones) even in

low level of intensity, it is most likely that the more primitive modes of empathy that do not require the mediation of cognition would be involved. Therefore, the affective dimensions of empathy would be expected to predominate over the cognitive ones.

A second explanation for the discrepancies between Eisenberg's results and those of the current study could be that, in the investigations by Eisenberg and colleagues, the HR deceleration indicated attention to a novel stimulus rather than an empathic reaction. Support for this notion comes from a study by Zahn-Waxler et al., (1995), who investigated HR patterns in children aged 4-5 during sadness induction, using videotaped story stimuli. They reported HR decrease as the sad story was introduced followed by an increase. The slowing of HR had begun before the sadness was expressed leading the researchers to conclude that it (i.e. slowing of HR) may be indicative of attention to a novel stimulus rather than of a particular mood. It seems plausible that, after an individual focuses his/her attention on another person who experiences an emotion - and thus HR deceleration is evident, this is followed by HR acceleration indicative of an empathic reaction.

An important finding of the study by Zahn-Waxler et al., (op cit) was that higher HR during sadness induction was found to be predictive of empathic concern, emotional arousal and prosocial behaviour expressed in a different context and point in time. This finding is of particular interest as, in the work by Eisenberg and colleagues, HR deceleration in the video-induced sadness episodes, has been associated with consistent prosocial behaviour within the context of the film (e.g. assist the needy person depicted in the film; Eisenberg et al., 1989, 1990a). However, it has failed to predict empathic concern and prosocial behaviour in other situations across time. This might suggest that HR deceleration does not consistently indicate sympathy. Nevertheless, it should be highlighted that in their series of investigations, Eisenberg and colleagues had stated that they did not take HR deceleration as an index of emotional reaction. Instead, it was viewed solely as an index of the other-oriented focus of attention (Eisenberg et al., 1991a).

In conclusion, HR deceleration during exposure to low intensity sadness seems to be a reasonable marker but not an invariant indicator (see Cacioppo & Tassinary, 1990) of attention to the needy other. It may be indicative of sympathy (resulting from

predominance of the cognitive dimensions of empathy over the affective), while HR acceleration is a marker of affective empathy. However, the latter (i.e. HR acceleration) seems to co-vary with the intensity of the stimulus and perhaps the age of the participants. In any case, HR acceleration should be taken as an imperfect marker of affective empathy and caution should be exercised in the interpretation of the results.

ii) Can Heart Rate (HR) discriminate between affective empathy to differing affective state in other?

In the on-going debate, whether emotional reactions are best thought of in terms of unidimensional arousal (see Schwartz *et al.*, 1981) or whether autonomic nervous activity differentiates between emotional states (see Ekman *et al.*, 1983), the empirical evidence concerning HR as marker of a range of emotions seems to be inconsistent (see Schwartz, 1986). Empirical investigations (e.g. Averill, 1969; Ax, 1953; Ekman *et al.*, 1983; Levenson *et al.*, 1991; Levenson *et al.*, 1990; Roberts & Weerts, 1982; Schwartz *et al.*, 1981; Shortt *et al.*, 1994; Sternbach, 1962) have yielded mixed results.

The present investigation repeats these mixed results in vicarious responsiveness to others' differing affective states. HR appears to be significantly higher in vicarious responsiveness to others' fear relative to others' anger. Therefore, present preliminary data, if replicated, seem to suggest that HR can discriminate between vicarious responsiveness across some but not all emotions.

2.6.4.3. Facial and physiological measures of affective empathy

The findings of the present study failed to support the hypothesis that facial and physiological measures of affective empathy would show high agreement. Agreement between the two measures in a 'typically-developing' group of children (aged 8-10) was at low to moderate degree, indicating that the two measures overlap to a modest degree in the phenomenon (i.e. affective empathy) they index. These findings suggest that the two methods should not be used interchangeably. Thus, it can be argued that facial measures cannot provide an alternative to the difficult-to-

implement physiological assessments in the measurement of vicarious affective arousal.

Possible reasons for moderate convergence between facial and physiological measures may be methodological. Firstly, although both measures are taken simultaneously and directly when the child is confronted with the affective stimulus, there is a substantial difference between them. The physiological measures do not require any coding. Whereas, the facial measures represent the evaluation of emotional experience by the coder, based on the judgement of the facial expressions, which judgement in some cases may not be accurate. In the present study, the inter-coder reliabilities for a random sample of eight children suggested reasonable consistency (Cohen's Kappa =0.75). In other studies, inter-coder agreement has generally been of a similar range or even higher (see Marcus, 1987). Nonetheless, facial measures still represent the subjective perception of the coder.

A second methodological factor that may be implicated in the middling agreement found between facial and physiological measures is that the relatively moderate emotional intensity aroused in an experimental setting may limit the specificity of the observed facial expressions (Fabes, Eisenberg & Miller, 1990). It has been argued that, at lower intensities at least, the observer might experience an emotion but produce only subvisible changes in the face, rather than full-facial prototypes of primary emotions (Levenson, 1988). At the same time, this arousal may be sufficient for detection from the particularly sensitive to low intensities equipment used in the physiological procedures, leading to a lack of correspondence between the facial expressions and the physiological indices.

Apart from methodological issues, the data of two 'extreme' groups of children seem to have played key role in the moderate agreement. One group (n = 4; 3 girls, 1 boy) consistently displayed facial expressions throughout the evocative episodes accompanied by moderate change in the mean HR during the evocative episodes relative to the baseline. On the other hand, another group of children (n = 5, 4 boys, 1 girl) consistently displayed high autonomic reactivity across all evocative episodes accompanied by complete absence of facial expressions.

The former group demonstrates a pattern that cannot be easily explained and the interpretation is only speculative. The procedures used in the present study allowed isolated viewing of the film, and therefore participants had no reason to fake their facial display for communicative purposes. The display of facial expressions therefore seems to verify the existence of vicarious affective experience. It therefore seems to be the case that this group of children are characterised by high capacity for physiological regulation, the capacity of the nervous system to foster rapid expression and attenuation of sympathetic arousal (see Porges, 1991). It might be that these children have a particularly high capacity for physiological regulation, which very quickly modulates their physiological arousal, returning rapidly to homeostasis. Consequently, the change in their mean HR across the evocative episodes relative to baseline was moderate. Moderate change in the mean HR in highly regulated children, in an evocative context, has been well documented (e.g. Cole, Zahn-Waxler, Fox, Usher & Welsh, 1996; Fabes, Eisenberg, Karbon, Troyer & Switzer, 1994). Further evidence that this group of children seem to be characterised by particularly high regulative skills is found in their facial expressions of emotions. They tend to facially express sadness in response to the protagonist's sadness but also in response to the protagonist's fear or anger. Or, they would very briefly express fear or distress followed by a rapid change to sadness. Derryberry and Rothbart (1984) proposed that sadness appears to be related to self-regulatory capacities.

Nonetheless, the interpretation that the group of children in the current study who consistently showed facial displays of sadness in response to another's sadness, fear or anger had a heightened ability to regulate their own arousal which resulted in a moderate change in mean HR, is not substantiated by strong empirical evidence. It should be emphasised that direct measures of physiological regulation have not been employed in the present study. Consequently, future studies could address this question by employing in a bigger sample size, direct indices of physiological regulation such as measures of HR variability which reflect the activity that functions to return the affective arousal of the individual to homeostasis (see Fox, 1989; Izard, Porges, Simons, Haynes, Hyde, Parisi & Cohen, 1991; Porges, 1991).

For the second 'extreme' group of children (who demonstrated high autonomic responses accompanied by complete absence of facial expressions of emotion), patterns seem to be more easily interpreted. This group could include children who mask or inhibit their emotions due to socialisation practices and/or temperamental characteristics (or perhaps an interaction of the two). In regard to socialisation practices, children who have been disapproved for expressing their emotions may gradually, by the age of 8-10, become able to mask them. Buck (1984) suggests that parental punishment for emotional displays results in masking any overt facial displays of negative emotion and increased internal feeling of distress in association with negative affect. In terms of temperamental characteristics, it has been evident that overanxious individuals learn to inhibit any facial expressions of emotion over the course of early childhood (Eisenberg & Fabes, 1992). At the same time, temperamentally overanxious individuals show particularly high arousal levels (Cacioppo & Sandman, 1978; Lazarus, 1974). Consequently, (given that at the same time these individuals inhibit their facial expressions) agreement of the two measures in this group is rather low.

Support for this speculative interpretation of the patterns across the two 'extreme' samples derives from a study by Buck, Savin Miller and Caul (1972) in which adult participants called 'senders' watched a series of slides designed to elicit various affective states. Other participants called 'observers' watched the 'senders' faces over closed-circuit television and made judgements about the nature and intensity of their affect. The main finding of interest in this study was a negative relationship between the sender's marker of physiological arousal, in this case Skin Conductance (SC), and the accuracy with which their facial expressions communicated affect to the observer. This finding may, in part, has been produced by the questioned reliability of the observers (i.e. the 'observers' judgements may reflect some of his/her own personality characteristics as well as attitudes regarding the way that individuals of the sender's type - e.g. age sex, etc - are believed to react). It seems however unlikely that all results could be attributed to the questioned reliability of the observers. Buck *et al.* (op cit) explained their results in terms of the greater SC accompanied by minimal expression of affect exhibited by 'internalisers' in conjunction with the high degree of overt affect accompanied by minimal

electrodermal change exhibited by 'externalisers'. Some early studies with adults (e.g. Lanzetta & Kleck, 1970) and also with children (Jones, 1960, as cited in Buck *et al.,* 1972) have shown that 'internalisers' have large changes in physiological measures of arousal with little overt affect, while 'externalisers' show minimal changes in physiological measures of arousal accompanied with high overt affect. Lanzetta and Kleck (1970) suggest that 'internalisers' are the persons who have been discouraged from overtly manifesting emotional responses openly leading to inhibition of overt emotional expression.

Related to the inhibition of overt emotional expressiveness is the influence of gender on the facial display of emotion. In the study by Buck *et al.,* (op cit), females tended to be 'externalisers' while males tended to be 'internalisers'. In the present study, the two measures showed lower agreement in boys than in girls. Buck *et al.* suggest that, in the western culture, young boys are systematically taught to inhibit and mask many kinds of emotions to a greater extent than girls, leading perhaps to a greater tendency for males to be 'internalisers' of affect.

The findings of the present study seem to question the long-standing view that considers facial expressions to be the natural and spontaneous outcome of an underlying emotional state. There is a whole debate behind this view starting from Charles Darwin's hypothesis that humans have a set of universal facial expressions which are vestiges of adaptive patterns shown by our ancestors (Darwin, 1872). This perspective has been supported by some cross-cultural studies (for a discussion of the studies see Ekman, 1973; Ekman & Oster, 1979; Fridlund, Ekman, & Oster, 1983; Izard, 1971; Russell, 1994) but the evidence is not conclusive (see Ekman, 1994; Izard 1994; Russell 1994; 1995).

As discussed above, there is empirical data in the present study - children who showed no facial expressions but consistently showed autonomic responses - to support the idea that facial expressions may not always be a direct link of the direct and/or empathically aroused affect. In other studies, it has been evident that facial displays of emotion become gradually reduced with age (Strayer, 1983) suggesting that facial expressions can be controlled. They do not seem to directly tap direct or

empathically aroused affect, at least, after a certain age. Children gradually become able to control their facial expressions.

Some theorists advocate that facial expressions are primarily communicative displays rather than a revelation of inner state, and they provide some empirical evidence to support their view (see Dimberg, 1988). For instance, in a study by Fernandez-Dols and Ruiz-Belta (1995), the gold medallists at the 1992 Olympic games were observed: i) whilst they waited for their medals; ii) while they received them, and; iii) when they stood for the national anthem. Nearly all medallists reported their mood during the entire awards ceremony as unambiguously happy. Even so, they rarely smiled while waiting to receive the medals or while listening to the anthem. Only when they received the medals from the presenters did they smile. This view has further been supported by additional empirical data demonstrating that adult bowlers did not smile at the moment of their success, but when they turned around and met the gaze of their friends (Kraut & Johnston, 1979). What holds for adults also holds for preschoolers, and even for 10-month-old infants who were found to smile more often when they turn to see their mother watching them (Jones, Collings & Hong, 1991).

Present data, though, do not support the view that facial expressions are solely communicative displays. On the contrary, facial expressions of emotions were displayed even when the individual - in this case the child - was on his/her own. Such findings indicate that facial expressions are not only communicative, but also spontaneous. Although the advocates of the communicative view might argue that, in this case, individuals act as both the sender and the recipient, or as if interacting with others present in their imagination (Chovil, 1991; Fridlund, 1991, 1994). This cannot be ruled out, as these authors again provide several lines of empirical evidence for many different facial expressions and across different situations (Chovil, 1991; Hense, Banse & Kappas, 1995; Jakops, Fischer & Manstead, 1997; Wanger & Smith, 1991). In a study by Fridlund (1991), for instance, participants watched an amusing tape in one of four contexts: i) with a friend; ii) believing that a friend was in the adjacent room also watching; iii) believing that a friend was in the adjacent room conducting a test; and; iv) believing that s/he was alone. Compared to

solitary viewing, participants laughed much more either when being with a friend or believing that a friend was watching.

Nonetheless, it could alternatively be that facial expressions of certain emotions are involuntary while others may be primarily communicative. In the present study, there was no expression of anger in any child. One explanation for this could be that anger is not empathically induced. It can lead to other emotions (e.g. sadness), as revealed in some patterns of present facial expressions data, but it does not seem to lead to vicariously induced anger. A second explanation could be that, in the western culture, a display of anger is more disapproved of than a display of other emotions, leading to an early inhibition of its facial display. A third explanation could be, however, that facial expression of anger is, to a considerable degree, communicative. Perhaps anger is facially-displayed when an individual wants to communicate his/her anger perhaps to the person s/he is angry with or to another person. Possibly anger is not involuntarily facially-displayed when the individual is on his/her own (unless both sender and receiver are perceived to be oneself) This third explanation (i.e. that expression of anger seems to be to a significant extent communicative) seems to have some indirect support from the verbal data which, in contrast to the facial data, some children responded feeling angry. Taken this way, they were communicating to the investigator their anger but they had no reason to display it facially earlier since they were on their own in the laboratory.

While facial expression of anger might be communicative facial expression of other emotions, for instance of sadness, or happiness, might be more involuntary. This is supported in the present patterns of data in which the children facially-displayed sadness in the most of the cases when the protagonist was sad. They also displayed happiness in the segment in which the protagonist was happy.

After all, it seems plausible that while facial expressions are to a certain degree spontaneous they can gradually be controlled (as a factor of age and display rules). They may be hidden or even faked in an individual's attempt to communicate what s/he wants. Perhaps his/her affective state primes the individual to facially express it while the social content determines which expressions s/he makes and when s/he makes them. In any case, if one is interested in assessing spontaneous expressions of

emotions, caution should be exercised in treating facial expressions as being the natural and spontaneous outcome of an underlying emotional state. As a consequence, an important issue arises regarding the use of facial measures in the assessment of affective empathy. If facial displays of emotion are not spontaneous, then probably sometimes individuals experience a vicarious response without displaying it facially. This methodology would result in faulty coding that there is no vicarious affective response present.

However, the facial measures could be more useful than physiological in a particular case. If one accepts that facial expressions are primarily communicative displays, then, as they consist of what the sender, at least in part, wants to communicate to the receiver, they would perhaps be better at predicting intention and, consequently, behaviour than physiological measures.

It should be noted, however, that even if considered as primarily communicative displays, it cannot be argued that facial expressions in the present study were faked or altered for communicative purposes, showing intention without actual existence of emotion. The reverse, however could be true. There might have been an emotion but in the absence of anybody else it was not facially-displayed. This is a limitation of studies assessing facial expressions in laboratory conditions in the absence of other confederates.

2.6.4.4. Physiological and verbal measures of affective empathy

Physiological indices of vicarious affective arousal and self-reports of vicarious emotional experience failed to converge. This finding accords with results reported for other samples (see Buck, 1984; Eisenberg, Fabes, Schaller & Miller, 1990b). However, in the present study, a greater elaboration was conducted: Agreement was assessed across a series of segments (not just one or two) and the findings projected across a range of different emotions. The two measures failed to give converging evidence not just for distress or sadness, as has been shown in other samples (see Buck, 1984; Eisenberg *et al.*, 1990b), but also across other emotions (i.e. anger and happiness) and across a series of segments.

The issue of what each of the measures taps is critical for interpreting the lack of convergence between the physiological and verbal measures. As has been evident across a systematic series of early and recent investigations, HR increase is indicative of vicarious affective arousal (e.g. Craig, 1968; Eisenberg *et al.*, 1988a; Eisenberg *et al.*, 1988b; Eisenberg *et al.*, 1988c; Kutina & Fisher, 1977; Scwartz *et al.*, 1981; Zahn-Waxler *et al.*, 1995). This pattern was also replicated in the present study.

On the other hand, what the verbal measures represent is children's verbally expressed interpretation of their conscious vicarious affective experience. In order to accurately report their vicarious affective arousal (represented by the physiological index of HR), it is required that they must be consciously aware of their vicarious responses. It is also necessary for them to have the verbal skills to categorise, label (at least if they are willing to do so in an honest way) and report their vicarious affective experience. In addition, they must be unaffected by demand characteristics or social-evaluation concerns.

There is experimental data which indicates that all these requirements are not met in the verbal self-reports of vicarious affective responsiveness. Firstly, self-report measures of emotional experience are affected to a considerable degree by verbal and introspective skills (Chisholm & Strayer, 1995). Secondly, there is evidence to suggest that self-report measures are influenced by concern with social evaluation and/or the wish to appear to oneself in socially desirable ways (e.g. Archer, Diaz-Loving, Gollwitzer, Davis & Foushee, 1981; Eisenberg *et al.*, 1989a; Eisenberg & Lennon, 1983). Self-reports of vicarious experience have further been found to correlate with indices of social desirability (Eisenberg *et al.*, 1989b; Eisenberg *et al.*, 1989a). Therefore, it seems possible that self-reports often may tell us as much about how respondents want to see themselves, or to be seen, rather than as how they actually feel or respond in empathy-inducing contexts.

For instance, in the present study, agreement between verbal reports and physiological indices of vicarious arousal was lower for girls than for boys (42 % for girls and 50 % for boys). This non-significant result is still worth commenting on, as the non-significance might be due to the small sample size of the sub-categories (14 boys and 15 girls), thus influencing the power of statistical analysis. One possible

reason for the lower agreement in girls might be that girls are more vulnerable to demand characteristics and social desirability. Some indirect evidence for this speculation is that gender differences favouring females in empathy are huge for self-report questionnaires of empathy in which it is obvious what is being indexed, but are smaller or non-existent for other type of indices that are less self-evident with regard to their purpose (see Eisenberg & Lennon, 1983; Lennon & Eisenberg, 1987).

A further factor that may be implicated in the lack of agreement between verbal reports and direct indices of vicarious affective responsiveness is that sometimes, verbal reports seem to tap sympathy rather than vicariously aroused affect. Batson, Dyck, Brand, Batson, Powell, McMaster, & Griffith (1988) found verbal indices of affective empathy to be ambiguous in meaning (i.e. they sometimes tap sympathy rather than vicariously aroused affect). Conceptually, it is assumed that sympathy is an outcome of vicariously aroused affect (see Eisenberg 2000), but there is no evidence to ensure that vicariously aroused affect would necessarily lead to feelings of concern for the person in distress. It has even been shown that when the intensity of the empathic arousal is too aversive, it might lead to self-focused direction of attention rather than to concern for the other's affective state (Batson, 1991; Eisenberg & Fabes, 1990). While sympathy may not always result from affective empathy, it may alternatively be based on cognitive perspective-taking or encoded cognitive information relevant to another's situation accessed from memory (Eisenberg, 2000). Consequently, given that, on the one hand, verbal reports might reflect sympathy and not empathically aroused affect, and on the other hand that the physiological indices tap empathically aroused affect but not sympathy, the failure of the two measures to converge seems to be reasonably explained.

A further source for the low convergence of verbal reports and the direct indices of vicarious affective responsiveness might be the data of children who have a particularly high ability to regulate vicarious (as well as direct) affective arousal. As discussed in section 2.6.4.3, it is well documented that well regulated children, have the ability to regulate their arousal and therefore their autonomic responses return rapidly to baseline (e.g. Cole *et al.*, 1996). It may be that highly-regulated children, who have been found in other studies to be more sympathetic to others (e.g.

Eisenberg *et al.,* 1988a, Eisenberg, Fabes, Murphy, Karbon, Smith & Maszk, 1996c), consistently verbally report a vicarious affective response (which, as discussed above may represent sympathy rather than empathic arousal; Batson *et al.,* 1988). At the same time they showed moderate mean HR change during the evocative episodes relative to baseline, as their vicarious arousal might have returned very quickly to baseline. Indirect support for this speculation comes from the greater divergence between verbal and physiological measures in girls rather than in boys discussed above. As there is evidence to suggest that girls have better regulatory skills, relative to boys of the same age (e.g. Eisenberg *et al.,* 1996c) the lower agreement of the two measures in girls gives some additional support to this speculation. However as discussed above, the finding for gender differences should be treated with caution. A larger sample size and measures of regulation are needed to allow more definite conclusions to be drawn. Additionally, the greater divergence between the two measures could be due to other factors such as the greater vulnerability of girls to social desirability and demand characteristics.

Other reasons for low convergence between autonomic and verbal measures may be methodological. In the procedure of the current study, autonomic measures were taken directly when the child was confronted with the affective stimulus, while the verbal measures were taken afterwards requiring the child to recall his/her emotional experience or to reconstruct it allowing a variety of cognitive processes – e.g. attentional processes, recall memory - to intervene.

Moving to the lack of convergence of the physiological measures with the Bryant empathy index (1992), this can be explained in the same way as the other self-report data described above. Bryant (1982) operationalises empathy as the vicarious response to the perceived emotion. Cognitive processing mediates both the perception and reporting of an emotion. For an emotion to be further hypothetically imagined as required in the Bryant (1982) questionnaire, it gets even more complicated.

In conclusion, verbal measures do not adequately tap vicarious affective arousal and therefore cannot be used interchangeably with physiological indices. In contrast, physiological responses can at least tap visceral arousal without interference from

social norms, verbal or introspective skills. They may reflect affective reactions of which the individual is not strongly aware or able to name (as well as those that are unconscious).

This is not to argue that verbal measures cannot be useful in particular cases. For instance, verbal indices are a better measure of conscious emotional experiences that the individual can categorise and label (especially if able and willing to do so in an honest way). They are also helpful in eliminating some spurious (e.g. sadistic reactions) effects of physiological indices.

2.6.4.5. Facial and verbal measures of affective empathy

The moderate agreement obtained between facial and verbal measures may indicate that the two measures overlap to a modest degree in the phenomenon they index. Therefore, their interchangeable use is not justified and results across the two methods would need to be treated with caution.

Present findings of modest, although statistically significant, convergence of facial and verbal measures are comparable to findings reported for other samples (e.g. Casey 1993; Chisholm, 1991; Eisenberg *et al.*, 1988a, 1989a). These findings indicate an important issue for both theory and method because they imply a possible disjunction between self-perceptions of emotional experience (as reflected in verbal measures) and evaluations of these emotional experiences by others, based on facial expressions.

The moderate levels of agreement of the two measures might merely be explained by the constraints from which verbal measures suffer (e.g. introspective and verbal skills, demand characteristics and social desirability) which have been presented in the above discussion (see section 2.6.4.4).

Other reasons for low convergence between facial and verbal measures are perhaps methodological. Firstly, facial measures are taken directly when the child is confronted with the affective stimulus, while the verbal measures are taken afterwards requiring the child to recall his/her emotional experience. Secondly, as discussed above, facial measures rely on the subjective judgement of the coder.

Thirdly, the relatively moderate emotional intensity that can be aroused in an experimental setting may limit the specificity of the observed facial expressions (Fabes *et al.*, 1990, see section 2.6.4.3). At the same time, this arousal may be adequate for participants to label their emotion leading to a lack of correspondence between the facial expressions and the verbal reports. In this case, higher frequencies would be expected in verbally-reported rather than in facially-displayed vicarious responsiveness - a pattern that was observed in the current data but which did not reach statistical significance. Consequently, the relatively moderate emotional intensity, that can be aroused in an experimental setting, which may potentially limit the specificity of the observed facial expressions only to a very limited degree, seems to account for the low convergence of the two measures.

Nonetheless, contrary to the physiological measures, facial measures were found to converge with verbal at a modest but still significant degree. The intriguing question would be why? Perhaps, partly, because both are measures of external emotionality. It would be more likely that temperamentally expressive children would score high in both, while inhibited children would more likely score low in both as they may tend to have inhibited verbal reports. Also, by the age of 8, children become increasingly able to mask or inhibit their facial expressions.

2.6.4.6. Conclusion

In conclusion, present findings indicate dissociation between physiological indices, self-perceptions (reflected in verbal measures), and evaluations of the vicarious affective responses by others based on facial expressions. Before deciding what measure might be the best for which case, the question of what each measure taps, as well as what it does not tap, is critical. If one is interested in the conscious emotional experience that children are able to name and categorise, then verbal measures might be the most suitable. If interested in verifying which specific emotion a child experiences, - based on the proviso that the emotion is displayed and it is not masked/inhibited - facial measures would be the most reliable. If interested in measuring the presence and degree of vicarious affective arousal, the findings of the present study along with a series of previous investigations have indicated that physiological measures are the most reliable.

Given that verbal and facial measures have not been found to adequately tap vicarious affective arousal, it is plausible that assessment of vicarious affective arousal using these measures has resulted in misleading conclusions. This effect might be more pronounced in the verbal measures which provided agreement with the direct indices of vicarious arousal only at chance levels. It might be that their use for comparable purposes has underestimated empathic responsiveness in special populations of children who are more vulnerable to the constraints that verbal measures suffer. For instance, this argument may apply to younger children or, of particular importance to the current thesis, CD children who, relative to 'typically-developing' children, may be more likely to show verbal skills deficits, diminished introspective skills, or diminished vulnerability to social desirability responses.

Chapter 3: Study 2

Affective empathy, antisocial conduct and conduct disorder (CD)

3.1. Overview

To summarise thus far, in the first chapter it has been argued that within the population of CD children, there are important sub-groups which may have distinct causal mechanisms underlying their conduct problems. It has been postulated that the recognition of this heterogeneity may be especially important in research on potential deficits in affective empathy in CD.

The second chapter focused on problems surrounding the measurement of affective empathy (operationalised as the capacity for vicarious affective arousal). It has been argued that the only indices of vicarious affective arousal that have well documented validity are the direct indices of arousal in an emotionally evocative context.

The current chapter reports the second study in which a direct index of vicarious affective arousal (i.e. increase in Heart Rate) is used to examine affective empathy in CD children, taking into consideration the heterogeneity within this group. Section 3.2 sets out a theoretical account of the role of affective empathy in the inhibition of antisocial conduct, discusses empirical evidence testing this theoretical account and forms the rationale for study 2. Section 3.3. outlines the method, section 3.4 reports the results and section 3.5. discusses the findings of study 2, a cross-sectional investigation set out to compare affective empathy across two CD subgroups and age-matched 'typically-developing' controls.

3.2. Introduction

Conceptually, the capacity for vicarious arousal with the affective state of another has been proposed to inhibit or at least mitigate aggression and more general antisocial conduct that hurts others. It has been suggested that observation of another's expression of distress or pain results in the vicarious experience of similar distress by the observer (Feshbach, 1978; Feshbach & Feshbach, 1982; Hoffman, 1984). Reduction of antisocial conduct in interactions with other individuals would

therefore be reinforcing for the aggressor because it would lessen negative vicarious arousal (Feshbach, 1978; Feshbach & Feshbach, 1982).

Based on the above theoretical premises (Feshbach, 1970; Feshbach, 1978; 1987; Feshbach & Feshbach, 1982; Parke & Slaby, 1983), it can be argued that CD children, who persistently and across an extended period of time manifest aggression and other forms of conduct problems (sometimes to extreme levels that endanger others' and their own life), may show diminished vicarious affective responsiveness towards others relative to 'typically-developing' children.

Much empirical research (e.g. Calkins & Dedmon, 2000; Cohen & Strayer, 1996; Kaplan & Arbuthnot, 1985; Lee & Prentice, 1988; MacQuiddy, Maise & Hamilton, 1987; Zahn-Waxler *et al.*, 1995) has been generated seeking support for these theoretical premises. Following the aforementioned lines of theorising aggression and, more generally, antisocial conduct (that includes aggression but is not restricted to it) would be expected to be associated with a lower capacity for vicarious affective arousal (i.e. affective empathy). However, the empirical investigations testing such theoretical premises are surrounded by inconsistencies and thus the evidence is far from conclusive.

Most frequently, these empirical investigations have used a correlational design in normative samples and tested the hypothesis that antisocial conduct would be associated with a lower capacity for affective empathy. Other investigations have employed a cross-sectional design comparing affective empathy in populations who showed high levels of conduct problems (e.g. delinquents) relative to controls. A few studies compared vicarious responsiveness in children who meet the CD criteria relative to typically-developing controls.

In reviewing the relevant literature, three key issues need to be taken into consideration. Firstly, the majority of correlational investigations tested relationships between aggression and affective empathy. Empirical data on other forms of conduct problems are scarce. The second issue pertains to the definition and operationalisation of aggression. In reviewing the literature, it was often not possible to determine how researchers defined this term. Therefore meaningful conclusions

cannot be drawn about whether, and how, varied forms of aggression might relate to affective empathy. The third issue is related to the effect that the criterion measure of affective empathy has in determining its relation with antisocial conduct (as well as with any other human attribute). In reviews on empathy and gender (Eisenberg & Lennon, 1983), empathy and prosocial behaviour (Eisenberg & Miller, 1987) and, more significantly, empathy and aggression/externalising behaviours (Miller & Eisenberg, 1988), the significance of the relation between empathy and these criterion measures was a function of the method used to assess empathy. For instance, in the review by Miller and Eisenberg (1988), a significant negative relation between empathy and aggression/externalising behaviours was found when empathy was assessed with questionnaires but not when assessed with facial, experimental induction and picture story methods. Additionally, the first study reported here has shown that different methods of assessment of affective empathy do not provide analogous information. Therefore, in order that meaningful conclusions may be drawn, the presentation of studies on the relation of affective empathy to antisocial conduct will be grouped in terms of the method of empathy assessment that was used.

Five methods of assessment have generally been used in studies pertaining to antisocial conduct in children and adolescents: i) picture/story measures in which children's self-reported responses to hypothetical stories (e.g. narratives, slide stories, short films) are scored in terms of the degree to which their reported affect matches that of a story protagonist; ii) self-reports on questionnaires designed to assess empathy/sympathy disposition (questionnaires do not differentiate between the two constructs); iii) peer-estimated measures designed to assess empathy disposition in others; iv) facial reactions to others' emotions as depicted in emotionally evocative films or picture/story stimuli, and; v) autonomic indices of vicarious affective responses in emotionally evocative contexts (mainly emotionally evocative brief films).

Across studies the most common procedures used for assessing conduct problems behaviour have been: i) other-ratings of problem behaviour that were then placed into diagnostic categories by using behaviourally based classification systems; ii)

observations/ratings of behaviour by peers, teachers, parents, or correctional staff that were categorised on the basis of relevant conduct problems but without using behaviourally based systems; iii) experimental paradigms in which relevant conduct problem behaviours were the focus of investigation, and iv) self-report scales of psychopathology.

3.2.1. The relationship of self-reports on picture/story measures of affective empathy to antisocial conduct and CD

In self-reports on picture/story measures, individuals' self-reported affective responses to hypothetical stories (e.g. narratives, slide stories, short films) are scored in terms of the degree to which their reported affect matches that of a story protagonist. Picture/story measures have been used mainly with children aged 3 -9 years.

Table 3.1 summarises the results of studies examining relationships between affective empathy, as assessed with these measures, and conduct problems (mainly aggression). Some of the studies employed more than one measure of conduct problems (e.g. self-reports and teachers ratings) and/or conducted distinct analyses for each gender or age group. As shown in Table 3.1, across 32 distinct analyses, employed across the 11 located studies, 10 provided support for the hypothesis (i.e. there exists a negative relation between affective empathy and antisocial conduct); 10 showed no support for the hypothesis, whilst 12 unexpectedly demonstrated a positive relationship between affective empathy and antisocial conduct.

Across these samples, only one study has tested the link between affective empathy and antisocial conduct in children who show sufficiently high levels of conduct problems that characterises CD. In this study, videotaped stimuli were used to assess affective empathy in clinically diagnosed, institutionalised CD adolescents (aged 14-18 years). Cohen and Strayer (1996) reported a significantly lower affect match in CD youths than in the typically-developing comparison group.

In a meta-analysis of published studies, unpublished manuscripts and dissertations (Miller & Eisenberg, 1988), no significant relationship between picture/story measures of empathy and antisocial conduct (mainly aggression) was reported.

These inconsistent findings are not surprising for a number of reasons. Firstly, as discussed previously (see chapter 2), there are reasons to believe that picture/story measures are unlikely to be valid indicators of whether affect has been aroused in the observer. Stated briefly: picture story measures seem to be particularly vulnerable to: **i)** demand characteristics (Eisenberg-Berg & Hand, 1979); **ii)** the sex of the experimenter (i.e. children score higher if tested by same sex-experimenters Eisenberg & Lenon, 1983); **iii)** short hypothetical story formats being insufficient to elicit empathic responsiveness (Hoffman, 1982a), and; **iv)** degree of verbal and introspective skills (Chisholm & Strayer, 1995). In the case of the verbal and introspective skills, for instance, Miller and Eisenberg (1988) found that when pre-school samples were excluded, the association between the picture/story measures of empathy and aggression appeared more consistent with expectations. In other words, verbal measures are inappropriate for children who do not possess adequate skills, both in emotional introspection and labelling of emotional states. The potential weakness of verbal reports was also highlighted in the findings of study 1 reported here, in which verbal reports did not show agreement with the direct measures of vicarious affective arousal (i.e. increase in HR).

Apart from the validity issue, there is a second possible reason for the low correlation between picture story measures of empathy and antisocial conduct, namely, this method of assessment assumes the unidimensionality of empathy. Many studies have used this method to assess empathic responses to both positive and negative emotions. Yet, empathy to negative emotions tends to be negatively related to boys' aggression, while empathy to positive emotions appears to be positively related to aggression (Feshbach, 1982). Also, adult males' empathy to positive emotions relates positively to cognitive role-talking skills, while empathy with negative emotions has been associated with empathic responsiveness (Davis, Hull, Young & Warren, 1987).

Table 3.1. Studies on the relationship between self-reports on picture/story measures of affective empathy and antisocial conduct

Study	Age, gender and N	Measure of affective empathy	Measure of antisocial conduct	Relation to hypothesis
N.D. Feshbach & S. Feshbach (1969)		FASTE	Teachers' ratings of peer-directed verbal and physical aggression	
	4-5 years M, N=24			-
	F, N=24			-
	6-7 years M, N=17			+
	F, N=18			-
Huckabay (1971)	6-8 years M and F, N=60	FASTE	Teachers' ratings of overt physical and verbal aggression	+
			Behaviours in an experimental situation:	
			Cheating	+
			Lying	+
			Lack of resistance to temptation	+
Iannotti (1975)[d]	5 and 7 years M and F, N=60	Affect matching	Self report of aggression in hypothetical situations	
		Emotional matching [b]		-
		Situational matching [c]		+
Bazar (1976-1977)	4-5 years	Affect matching	Teachers' ratings of children:	
	M, N= 36		Teasing	0
			Physical force in disputes	0
			Wildness in games	0
			Under-control scale	-
	F, N=36		Teasing	0
			Physical force in disputes	0
			Wildness in games	-
			Under-control scale	-
Marcus, Roke & Bruner (1985)	3-6 years	Affect matching	Teachers' ratings of peer-directed physical and verbal aggression	
	M, N= 21			-
	F, N=11			-
Nielsen (1976)	Adolescents, M	Affect matching	Teachers' ratings	+
Steinman (1979)	6 and 8 years M, N=72	FASTE	Disrupting peers winning a game in an experimental situation	+

N.D. Feshbach (1980, 1982)[d]	8-10 years M and F, N = 50	Videotape affect matching task Affect matching:	Peers' teachers' and self ratings of aggression	
	M	euphoric affect	Ratings in general	0
		dysphoric affect Affect matching x Affect intensity		0
		euphoric affect	Teachers' ratings Peers' ratings Self ratings	0 − −
	F	dysphoric affect Affect matching	Ratings in general Ratings in general	+ +
		Affect matching x Affect intensity	Ratings in general	+
Howard 1983	4 years M, N=17	Affect matching	Observers' ratings of peer directed aggression Physical Nonphysical	+ 0
	F, N=18		Physical Nonphysical	− −
Staub (1986) and Staub & Feinberg (1980)[d]	8 –10 years		Observers' rating of peer directed hostile and instrumental aggression (physical and verbal)	
	M, N=20	Parallel matching affect		0
	F, N=26	Parallel Matching affect[e] Sympathetic affect		0 0
Cohen & Strayer (1996)	Institutionalised CD; aged 14 -17; M, N=14, F, N=16 Comparison group; aged 14 -17; M, N=15, F, N=17	Affect matching to video- taped vignettes		+

Note: M=male; F=Female, G=Grade; P= Preschoolers; N=Number of Participants FASTE= N.D. Feshbach and Roe (1968) Affective Situation Test of Empathy; Affect matching=empathy was assumed if the participants' reported affect matched that of the hypothetical other; + denotes support for a negative relationship between measure of empathy and antisocial behaviour; -indicates a positive relationship between measure of empathy and antisocial behaviour; 0 indicates no support for such a relation.
[a]Matching of one's own affect to the facial cues of another if facial and situational cues are incongruent; [b] matching of one's own affect to the facial cues of another if facial and situational cues are incongruent; [c] matching of one's own affect to situational cues rather than facial if facial and situational cues are incongruent; [d]as cited in Miller and Eisenberg 1988; [e]no boys reported sympathetic affect.

3.2.2. The relationship of self-report questionnaires measures of affective empathy to antisocial conduct and CD

Unlike the picture/story measures, which have mainly been utilised in young children, self-report questionnaires have more often been used with older children and adults. As described in chapter 2, self-report questionnaires are designed to assess empathic/sympathetic (the questionnaires do not typically differentiate between the two terms) tendencies across a variety of hypothetical events and situations.

Table 3.2 summarises the results of studies examining relationships between affective empathy, as assessed with questionnaire approaches, and conduct problems. Across 26 distinct analyses, employed in the 9 located studies, 11 corroborated the hypothesis of a negative relationship between affective empathy and measure of conduct problems; 12 provided no support for the hypothesised relationship. Three analyses (all utilising the Bryant Empathy Index) showed a positive relationship between affective empathy and measure of conduct problems.

Some studies tested the link between affective empathy and conduct problems in children who show high levels of conduct problems (e.g. delinquents). Reported results have, in general, been inconsistent. In such a study, Bryant (1984, as cited in Miller & Eisenberg, 1988) reported a negative relation between the Bryant Empathy Index score and mothers' ratings of conduct problems using a profile derived from the Child Behaviour Checklist (Achenbach, 1978; Achenbach & Edelbrock, 1979) in 7 year-old cohorts retested at 10 for degree of conduct problems. However, there was a positive relation between these measures in the 10 year-old cohorts retested at 14 for degree of conduct problems. Kaplan and Arbuthnot (1985) found no differences between 15-year-old delinquent and typically-developing adolescents on Bryant's empathy index. Similarly, Lee and Prentice (1988) found no significant differences between 16-year-old delinquent youths and typically-developing adolescents on Mehrabian and Epstein's (1972) Emotional Empathy Index, or on any of the scales (empathic concern, personal distress, fantasy and perspective taking) of Davis' Interpersonal Reactivity Index (IRI).

Additionally, a few studies have attempted to address the issue of possible heterogeneity within delinquent samples. In one such study, comparing aggressive to non-aggressive delinquent adolescents, Lee and Prentice (1988) reported no significant differences on any of the scales of Davis' Interpersonal Reactivity Index (IRI), or on Mehrabian and Epstein's (1972) Emotional Empathy Index. In contrast, Aleksic (1976) and Hunter (1985, as cited in Miller & Eisenberg, 1988), using Mehrabian and Epstein's (1972) scale, reported significantly lower levels of self-reported empathy in aggressive compared to non- aggressive delinquent adolescents. Lee (1983), comparing delinquents characterized as psychopathic (on the basis of correctional staff ratings) to a normative control group, reported conflicting patterns of results between Mehrabian and Epstein's empathy scale and Davis' IRI. Adolescent psychopathic delinquents scored lower relative to a typically-developing control group on the Mehrabian and Epstein's (1972) empathy scale. Interestingly, Davis' IRI produced opposite results, namely, a positive association between self-reported empathy and correctional staff's rating of psychopathic delinquency. The patterns of findings in this particular study, however, would need to be interpreted with caution as the mean score of the four subscales (empathic concern, personal distress, fantasy and perspective-taking) of the IRI was utilised. This blends affective and cognitive dimensions of empathy to a particularly high level. Therefore, the conclusions may be misleading. In addition, these studies with delinquents do not give adequate information to determine whether or not the delinquent samples met the CD diagnostic criteria.

In a sample that has been reported to meet the CD criteria, parent-identified CD boys were not found to differ on the *Bryant Empathy Index* score relative to typically-developing boys aged 5-7 years (MacQuiddy, *et al.,* 1987). CD boys were identified on the basis of their score on the Intensity or Problem Frequency scale of the Eyberg Child Behaviour Inventory (ECBI) (Eyberg & Ross, 1978). The results of this particular study, however, would need to be interpreted with caution as the particularly small sample size (11 CD and 12 typically-developing boys) reduced the statistical power of the analyses. In addition, parents tend to be less reliable informants of children's conduct problems (see Elander and Rutter, 1996). In clinically diagnosed, institutionalised CD adolescents (aged 14-17 years), Cohen and

Strayer (1996) reported significantly lower scores for the CD youth group relative to the typically-developing group on Bryant's empathy index (1982) and Davis's (1983) Empathic Concern scale.

In Miller and Eisenberg's (1988) meta-analysis (of adult and child samples), self-report questionnaire measures of empathy (with most of the included studies utilising the Mehrabian and Epstein scale and a single study utilising the Bryant Empathy Index), were found to be significantly negatively correlated with antisocial conduct (mainly aggression). The relationship appeared to be consistent across all samples age range, from middle childhood to adulthood, as well as for subgroups varying in levels of conduct problems.

However, it seems unlikely that questionnaire measures assess just affective empathy. As discussed in section 2.6.1.1 self-report questionnaires have been found in other research to be ambiguous in meaning (e.g. Batson *et al.*, 1988). They sometimes seem to tap sympathy rather than empathic arousal (e.g. Batson *et al.*, 1988). If affective empathy is operationalised as the ability to be vicariously aroused by another's affective state whereas sympathy is defined as the concern for another's affective state (see section 2.4) then, in order to test conceptual expectations, measurement techniques that differentiate between the two related but not identical constructs of empathy and sympathy need to be used.

A second concern regarding the reliability of studies utilising self-reports is the bias that may result from self-presentation and social desirability (Eisenberg *et al.*, 1989a; Eisenberg *et al.*, 1989b). It could be, for instance, that children more likely to be involved in antisocial behaviour are at the same time less vulnerable to social desirability. In the study by Cohen and Strayer (1996), the CD group showed a diminished tendency, compared with the typically-developing comparison group, to respond in a socially desirable way - as indicated in the 48-item self-report scale (Crandall, Crandall & Katkovsky, 1965) designed to assess endorsement of socially appropriate behaviour. Also, social desirability across groups was correlated significantly with the Bryant Empathy Index Questionnaire and with the Empathic Concern Scale of IRI (Davis, 1983). Significant correlations between questionnaire

measures of empathy and social desirability were also observed in other studies (see Eisenberg & Miller, 1987) but not all (e.g. Bryant, 1982).

The potential weakness of the Bryant Empathy Index to tap vicarious affective responding per se was highlighted in study 1 reported here. The *Bryant Empathy Index* did not give converging evidence with the more direct measures of affect, the facial and physiological measures.

Table 3.2. Studies on the relationship between self-report questionnaire measures of affective empathy and antisocial conduct.

Study	Age, gender and N	Measure of affective empathy	Measure of antisocial conduct	Relation to the hypothesis
Aleksic (1976)	14-16 years, incarcerated delinquents, M, N=80	Mehrabian and Epstein's empathy (1972) scale	Administration of noise in learning task. Intensity * duration	+
Eysenck (1981)	13-14 years	Junior 16 questionnaire. Empathy Scale	Self reports of	
	M, N= 101		Psychotism	+
			Antisocial behaviour	+
	F, N= 306		Psychotism	+
			Antisocial behaviour	+
Kurtz & Eisenberg (1983)	8-9 years; F, N=86	Mehrabian and Epstein's empathy (1972) scale	Behaviours in experimental situation. Resistance to deviation composite (latency, frequency and duration)	+
Bryant (1982)	6 years	Bryant Empathy Index (1982)	Teachers' ratings of peer-directed physical and verbal aggression	
	M, N, =14			+
	F, N=12			-
	9 years			
	M, N, =54			+
	F, N=57			-
	12 years			
	M, N, =41			+
	F, N=52			+
Bryant (1984)[a]	7 year-old cohorts retested at 10 years for conduct problems, M and F, N= 67	Bryant Empathy Index (1982)	Mothers' ratings of children's conduct problems	+

	10 year-old cohorts retested at 14 years for conduct problems; M and F, N=73			-
Kaplan & Arbuthnot (1985)	15 years delinquents, M, N=10, F, N=10 comparison controls M, N=10, F, N=10	Bryant Empathy Index (1982)		0
MacQuiddy, et al.,(1987)	5-7 years, M, CD, N=11; comparison controls, N=12	Bryant Empathy Index (1982)	Mothers' ratings of children's conduct problems	0
Lee & Prentice (1988)	16 years psychpopathic deliquents[b], M, N=12 ; neurotic delinquent[s], M, N=12 ; subcultural delinquents[b], M, N=12 ; Controls, M, N=12	Mehrabian and Epstein's empathy (1972) scale		0
		IRI (Davis 1983)		
		Empathic Concern subscale		0
		Personal Distress subscale		0
		Fantasy subscale		0
		Perspective-taking subscale		0

Note: M=male; F=Female; P= Preschoolers; Bryant Empathy index =Index of Empathy for Children and adolescents (Bryant, 1982); IRI: Interpersonal Reactivity Index (Davies, 1983) + denotes support for a negative relationship between measure of empathy and antisocial behaviour; -indicates a positive relationship between measure of empathy and antisocial behaviour; 0 indicates no support for such a relation.
[a]as cited in Miller & Eisenberg (1988); [b]Based on Quay & Parsons (1971).

3.2.3. The relationship of peer-estimated measures of affective empathy to antisocial conduct

The Peer-Estimated Empathy Scale (Kaukiainen Bjorkqvist, Osterman, Lagerspetz & Forsblom, 1995) is a relatively new measure of affective empathy assessment. In this

scale, the participants rate their same-sex classmates on 8 items: i) helps classmates in trouble; ii) comforts others when sad; iii) is able to feel joy about the success of others; iv) avoids hurting others' feelings; v) I think that s/he understands how I feel; vi) is upset when others are not treated fairly; vii) when I feel bad I think s/he understands, and; viii) notices quickly if others get hurt by a situation.

In one of the first studies to use the Peer-Estimated Empathy Scale (Kaukiainen, Bjorkqvist, Lagerspetz, Osterman, Salmivalli, Rothberg & Ahlbom, 1999), empathy was found to be negatively correlated with physical, verbal and indirect aggression when social intelligence (operationalised as social skills competency) was partialled out. This was found in all tested age groups (10, 12 and 14-years-olds) except indirect aggression in 12-year-olds. For the combined data across all age groups, the negative correlation was stronger with verbal aggression followed by physical and indirect aggression. Similar patterns were observed in a subsequent study employing the Peer-Estimated Empathy Scale (see Bjorkqvist, Ostreman, & Kaukiainen, 2000). Again, empathy was found to be negatively correlated with indirect, verbal and physical aggression and correlations were significant only after social intelligence was partialled out. In this study, the negative correlation was stronger with indirect aggression followed by verbal and physical aggression. The finding in both of these studies that empathy was negatively related to aggression only after social intelligence was partialled out seems to indicate that the relationship of affective empathy (as assessed by peer estimations) to aggression is mediated by social intelligence.

The Peer-Estimated Empathy Scale (Kaukiainen *et al.*, 1995) has been utilised by Kaukiainen and colleagues across a series of other investigations, supporting the claim that this new measure produces encouraging results (see Bjorkqvist, Ostreman, & Kaukiainen, 2000). However, in our view, the Peer Estimated Scale is unlikely to tap empathy operationalised as vicarious affective arousal. For instance, some of the items on this scale (e.g. helps classmates in trouble, comforts others when sad) seem to tap prosocial behaviour rather than vicarious affective responding. Others (e.g. I think that s/he understands how I feel) seem to tap cognitive dimensions of empathy rather than affective. Additionally, it is not easy to assess empathy, operationalised as

the vicarious affective response with the use of peer estimations. Empirical data have shown considerable problems with self-estimations. Concerns have justifiably been raised regarding the degree to which children (especially young children) can decipher and accurately communicate their own emotional states (Chisholm, & Strayer 1995; see chapter 2). If children (and sometimes adults) find it difficult to decipher and accurately communicate their own affective state, it seems debateable that they can infer and communicate the emotional state of their peers. If such judgements are based on peer behaviour, then what is being assessed is not the affective state of an individual but his/her behaviour. This could stem from a particular affective state but it could equally be a function of a variety of other interactive, situational and/or dispositional factors (e.g. cognitive empathy, social intelligence).

Table 3.3. Studies on the relationship between peer-estimated measures of affective empathy and antisocial conduct.

Study	Age, gender, N	Measure of affective empathy	Measure of antisocial conduct	Relation to hypothesis
Kaukiainen, Bjorkqvist, Lagerspetz, Osterman, Salmivalli, Rothberg & Ahlbom (1999)	Age: 10, 12 and 14 years Combined, M, N, = 274, F, N=252	Kaukiainen, Bjorkvist, Osterman, Lagerspetz & Forsblom (1995) peer – estimated empathy scale	Peer – Estimated	
			Physical Aggression	+[a]
			Verbal Aggression	+[a]
			Indirect Aggression	+[a]
	Age 10 F, M, N=168		Physical Aggression	+[a]
			Verbal Aggression	+[a]
			Indirect Aggression	+[a]
	Age 12 F, M, N=191		Physical Aggression	+[a]
			Verbal Aggression	+[a]
			Indirect Aggression	0[a]
	Age 14 F, M, N=161		Physical Aggression	+[a]
			Verbal Aggression	+[a]
			Indirect Aggression	+[a]
(Bjorkqvist, Ostreman, & Kaukiainen 2000)	Age 12 years, M, F, N=203	Kaukiainen et al., (1995) peer – estimated empathy scale	Physical Aggression	+[a]
			Verbal Aggression	+[a]
			Indirect Aggression	+[a]

M=male; F=Female, G=Grade; P= Preschoolers; N= Number of Participants;
[a]when social intelligence was partialled out.

3.2.4. The relationship of facial measures of affective empathy to antisocial conduct

In this method, the facial reactions to others' emotions or states as depicted in films or picture/story stimuli are coded in terms of the presence of specific emotions. Facial measures were originally developed for young children to offset the problems inherent in self-report measures (e.g. vulnerability to verbal and introspective skills, demand characteristics).

Table 3.4 summarises the results of studies examining the relationship between affective empathy (as assessed by facial measures) and antisocial conduct. In some of these studies, measures of children's positive as well as negative facial affect were used. Conceptually however, the relationship between expression of negative facial affect (in response to another's negative affect) and lower levels of conduct problems is clearer than the relationship between the expression of positive facial affect (in response to another's negative affect) and conduct problems (see Feshbach, 1982). Expression of positive affect in response to another's negative affect might be ambiguous. For instance, it might be reflecting joy with the victim' s suffering but it could also reflect discomfort.

Across 25 distinct analyses employed in the five located studies (some of the studies employed more than one measure of antisocial conduct, examined distinctively expression of positive and negative facial expressions, and/or conducted distinct analysis for each gender and/or age group), eight corroborated the hypothesis of a negative relationship between expression of negative affect and antisocial conduct. In contrast to conceptual expectations, four showed a positive relationship between expression of negative affect and antisocial conduct. Four demonstrated a positive relationship between the expression of positive affect (in response to another's negative affect) and antisocial conduct (which might be hypothesised to be indicative of a negative relation between empathy and conduct problems behaviour). One analysis showed a negative relationship between expression of positive affect (in response to another's negative affect) and conduct problems (which might be hypothesised to be indicative of a positive relation between empathy and conduct

problems). Finally, seven analyses demonstrated no support for the hypothesised relationship.

In the meta-analysis of five studies by Miller and Eisenberg (1988) no significant correlation was found between facial measures of empathy and conduct problems (mainly aggression). In three of these included studies, the empathy measure combined children's positive facial affect as well as negative facial affect (in response to another's negative affect). However, given that conceptually the relation between negative facial affect and lower levels of conduct problems is clearer than the relation of positive affect to conduct problems (see above; and Feshbach, 1982), Miller and Eisenberg recomputed the analysis relating only negative facial affect to conduct problems. Nevertheless, the relationship of negative facial affect to antisocial conduct remained non-significant.

However, although facial measures are considered to be a promising mode of assessing empathy (as they are unaffected by verbal and introspective skills, and the way they are usually collected - i.e. with a hidden camera which make them less susceptible to self-presentation or social desirability bias), their ineffectiveness for individuals who mask or inhibit facial expression decreases the strength of their predictiveness (see chapter 2; Shennum & Bugental, 1982).

Table 3.4. Studies on the relationship of facial measures of empathy to antisocial conduct.

Study	Age, gender, N	Measure of affective empathy	Measure of antisocial conduct	Relation to hypothesis
Ekman, Liebert, Friesen, Harrison, Zlatchin, Malmstrom & Baron (1972)	5-6 years	Facial reactions to aggressive films	Aggressive game and play behaviour in experimental situations	
	M, N=15	Pleasant		+[a]
		Interest		-[a]
		Happy		+[a]
		Pain		+
		Sad		+
	F, N=15	Pleasant		0[a]
		Interest		0[a]
		Happy		0
		Pain		-
		Sad		0
Steinman (1979)	6 and 10	Facial reactions to	Intensity by duration of	

94

	years, M,	film of two men fighting	aggression toward peer in experimental game	
	6years, N=27	Pain		-
		joy		+[a]
	10years, N=25	Pain		+
		joy		+[a]
Howard (1983)	4 years	Facial reactions during administration of picture/ story measure	Observers' ratings of peer-directed aggression	
	M, N=17		Physical	+
			Nonphysical	+
	F, N=18		Physical	-
			Nonphysical	-
Marcus, *et al.*, (1985)	3-7 years	Facial reactions during administration of picture/ story measure	Teachers' ratings of physical and verbal peer directed aggression	
	M, N=21			+
	F, N=18			+
Solomon (1985)	P, 7-11years	Facial reactions to films of children in negative situations	Teachers' ratings of verbal hostile and physical aggression toward peers	
	M, N=42	Pleasure		0[a]
		Sadness		0
	F, N=43	Pleasure		0[a]
		Sadness		+

Note: M=male; F=Female, G=Grade; N= Number of Participants; P= Preschoolers;
[a]A positive relation between positive affective reactions to aggressive films and aggressive behaviour is consistent with the hypothesis of a negative relation between empathy and aggression

3.2.5. The relationship between physiological measures of affective empathy to antisocial conduct

The use of physiological indices (e.g. increase in HR) of arousal in emotionally evocative contexts is a relatively new methodology. Due to difficulties of implementation, it has scarcely been employed. However, although difficult to implement, the physiological indices of arousal have the advantage of being able to tap the capacity for vicarious arousal per se, which allows more direct testing of the theoretical expectations (see chapter 2).

In one of the few studies using physiological indices of arousal for examining the relationship of affective empathy to conduct problems behaviour, Zahn-Waxler *et al.*, (1995) classified children (aged 4-5 years) into high, moderate and low risk for developing CD on the basis of combined data from the *Child Behaviour Checklist* (CBCL), Parent version (Achenbach & Edelbrock, 1983) and the Teacher Report Form (TRF; Achenbach & Edelbrock 1986). Zahn-Waxler *et al.* (1995) reported that lower HR in sadness mood induction (two emotionally evocative videotaped scripts) was consistently associated with aggression, particularly verbal aggression in hypothetical distress dilemmas enacted by puppets. However, importantly, the three groups did not differ from each other in HR patterns in response to the evocative episodes. Nonetheless, the results of this particular study should be interpreted with caution. Although the three groups differed from each other on the externalised scales, the total behaviour problem score (i.e. combining internalising and externalising symptoms) was used as a basis of classification.

In a relatively recent study, conducted by Calkins and Dedmon (2000) and using a younger sample (aged 2-3 years), two groups were selected on the basis of parents' responses to two administrations of the Child Behaviour Checklist (CBCL, 2-3 version, Achenbach, Edelbrock and Howell, 1987). The 'high-risk' group displayed symptoms of CD (i.e. aggressive destructive symptoms) in the borderline clinical range. Whilst, the 'low-risk' group displayed few such symptoms. In an emotionally evocative episode (crying infant), children's HR was significantly increased from the baseline to the evocative episode but this effect was irrespective of the risk group.

Thus, the evidence from the two aforementioned studies does not support an early direct link between deficits in the capacity for vicarious arousal and CD. However, the evidence is not conclusive for two critical reasons: Firstly, the study by Zahn-Waxler used, as a basis of classification, both externalising and internalising symptoms. Secondly, neither of the two studies considered a plausible heterogeneity within CD children.

Table 3.5. Studies on the relationship of physiological indices of affective empathy to antisocial conduct

Study	Age, gender and N	Measure of affective empathy	Measure of conduct problems	Relation to the hypothesis
Zahn-Waxler, Cole, Welsh & Fox (1995)	4-5, M, N=51, F, N=31	HR during mood induction (emotionally evocative film)	Aggression in hypothetical distress dilemmas enacted by puppets.	
			Verbal	+
			Physical	+
			Externalising problems[a]	0
Calkins & Dedmon (2000)	2 years, High risk group for developing CD[b], M, F, N=50 Vs. typically-developing controls, M, F, N=49	HR during emotionally evocative episode (crying infant)	Parents version of the Child Behaviour Checklist (CBCL, 2-3 version, Achenbach, *et al.*, 1987	

M=male; F=Female, G=Grade; N= Number of Participants
[a]On the basis of total behaviour problem score (i.e. combining internalising and externalising symptoms) on Child Behaviour Checklist (CBCL), Parent version (Achenbach & Edelbrock, 1983) and the Teacher Report Form (TRF; Achenbach & Edelbrock 1986). [b] The 'high-risk' group displayed symptoms of CD (i.e. aggressive destructive symptoms) on the Child Behaviour Checklist (CBCL, 2-3 version, Achenbach *et al.,* 1987) in the borderline clinical range

3.2.6. Factors implicated in the inconsistencies across studies and rationale for study 2

To summarise thus far, it seems that the marked inconsistency across studies examining affective empathy in children with conduct problems may mostly be the outcome of five interrelated factors: i) operationalisation of the term empathy; ii) definition and operationalisation of aggression; iii) criterion measure of conduct problems; iv) heterogeneity within the target population, and; v) measures employed to assess affective empathy.

i) Operationalisation of the term empathy

As discussed in section 2.2 the term empathy has variously been operationalised as affective-perspective taking, vicarious affective response to a person's affective state or as a joint operation of affective-perspective taking and vicarious affective responses. Additionally, it has often been used interchangeably with the term sympathy (i.e. concern for another's affective state). In the present review, studies

that operationalised empathy in terms of affective perspective-taking are not included. Studies, however, that operationalised empathy in terms of a joint operation of both affective and cognitive dimensions or have used the term interchangeably with the term sympathy (e.g. questionnaire methods) are included.

ii) Definition and operationalisation of aggression

A second possible explanation for results which confound the hypothesised link between affective empathy and specifically aggression, is that the definition and operationalisation of aggression were not adequately differentiated. For instance, many researchers currently draw distinctions between reactive aggression that appears to be a response to antecedent conditions such as goal blocking and provocation, and proactive aggression that occurs in anticipation of self-serving outcomes (Dodge & Coie, 1987). Some individuals are considered to be primarily proactively aggressive while others are primarily reactive. Reactive aggression is more strongly related to a temperamental predisposition for angry reactivity and emotional disregulation (Martin & Rodeheffer, 1976; Shields & Cicchetti, 1998) and to physical abuse (Dodge et al., 1990). Reactively aggressive children have been found to have difficulty in employing effective problem-solving skills and suffer from attribution bias in ambiguous social situations (Crick & Dodge 1992; Crick & Dodge, 1996; Dodge & Coie, 1987). Children involved in proactive aggression, on the other hand, report fewer symptoms of anxiety and expect more positive outcome from their behaviour (Dodge & Coie, 1987; Dodge et al., 1997). As different forms of aggression have been shown to have different correlates (Dodge et al., 1990; Martin & Rodeheffer, 1976; Shields & Cicchetti, 1998), it might be that affective empathy is negatively related to some forms of aggression but not to others (for a more detailed discussion on the correlates of different forms of aggression see section 1.4.1). It could be, for example, that children prone to reactive aggression do not show deficits in vicarious affective arousal. Perhaps their aggressive behaviour is more related to affect disregulation rather than any deficit in the capacity for vicarious arousal. Indeed, as discussed above there are experimental data showing reactive aggression to be more strongly related to emotion disregulation (Martgin & Rodeheffer, 1976; Shields & Cicchetti, 1998).

iii) Criterion measure of conduct problems

A third factor is the criterion measure of conduct problems (e.g. rating scales, administration of aversive noise, aggressive responses in role-playing situations, game disruption). It is, for instance, debatable whether some of these measures of antisocial conduct could reasonably be expected to be influenced by individuals' vicarious affective responses. For example, game disruption may be most likely to be mediated by existing normative rules and modelled competitive behaviour rather than vicarious affective responsiveness. It is plausible that in many of the studies reviewed above, the expression of antisocial conduct was situation specific offering an inadequate basis for testing conceptual expectations. Perhaps a more robust testing of conceptual expectations linking deficits in empathy to antisocial conduct would be to test this link in CD children who persistently display chronic patterns of conduct problems.

iv) Heterogeneity of the target population

A fourth factor is the heterogeneity of the target population. The reviewed studies included very diverse groups, from normative samples rated for conduct problems to delinquents and institutionalised or clinically identified CD samples. The considerable diversity within the children identified as presenting conduct problems or identified as delinquents may have masked differences between subgroups of these children and typically-developing controls. Possibly, delinquency is an insufficient discriminator given that it is a legal and not a psychological classification reflecting a diverse spectrum of difficulties. It might be that studies with delinquent samples do not allow generalisation of the results across CD children.

But even in the studies that have claimed to examine CD samples, it is not always clearly indicated whether persistency, chronic nature, degree and extent of conduct problems were taken into consideration, these being the defining diagnostic criteria of CD. It is likely that some studies included samples that showed situational patterns of conduct problems. Deficits in affective empathy may be specific to the children who show a variety (and not just a few) persistent and chronic conduct problems at extreme levels. In other words, those who meet the diagnostic criteria of CD.

But even within the group of children who meet the diagnostic criteria for CD there appears to exist great diversity. There is a growing body of empirical literature suggesting that CD children are a diverse group that differs in terms of developmental trajectories, types of behaviours exhibited, and the causes of behaviour problems (see Cicchetti & Rogosch, 1996; Moffitt, 1993b; section 1.4.).

One relatively recent approach, proposed by Frick and colleagues (Frick, 1998; Frick et al., 2000b, see section 1.4.5) classifies subgroups in terms of the presence of callous unemotional (CU) traits. The logic behind this classification system derives from studies revealing distinct correlates for the subgroup of CD children who also show high levels of CU traits (CD/CU) compared to those who do not (CD/cu). For instance, CD/CU children have been found to show high levels of thrill and adventure-seeking (i.e. fearlessness; Frick et al., 1994b, Frick et al., 1999), and to be less responsive to punishment cues (O' Brien & Frick, 1996), both of which are indicative of low behavioural inhibition. CD/CU children have also been found to be less likely than other children with CD to be raised in families with ineffective parenting strategies (Wootton, Frick, Shelton & Silverhorn, 1997) and less likely to show intellectual deficits (Christian et al., 1997; Loney et al., 1998).

These distinct correlates have been used as a basis for hypothesising different causal processes underlying the antisocial behaviour of the CD children who show CU traits and those who do not. In CD/cu, their lack of impulse control has been proposed to be related to a diverse set of interacting causal factors (see Frick & Ellis, 1999; Frick et al., 2000b). Such factors include social information processing deficits perhaps due to being raised in hostile and abusive home environment (Dodge et al., 1990), difficulties in anticipating the consequences of their behaviour or delaying gratification due to low intelligence (Loney et al., 1998). Other factors include inadvertent reinforcement of negative behaviour due to inconsistent discipline which makes it more difficult for the child to learn the message that is conveyed through discipline (Patterson, 1982) and harsh discipline which can make the child too focused on the consequences of the behaviour to self and prevent him/her from internalising the message or values being conveyed by the parent (Kochanska, 1993). On the basis of some preliminary evidence (Cornell, Warren, Hawk, Stafford, Oram

& Pine, 1996; Kruh, Frick & Clements, in press) it has been suggested that CD/cu children present predominantly reactive aggression (Frick & Ellis, 1999).

In contrast, CD/CU children have been suggested to present predominantly proactive aggression (Frick & Ellis, 1999). They are seen to constitute a more homogeneous group in respect of the aetiology of their lack of behaviour control. It is proposed that their behaviour is more related to a temperament characterised by low behaviour inhibition (Frick *et al.*, 2000b; Frick & Ellis, 1999) which, in turn, is due physiologically to underactivity in the sympathetic autonomic nervous system. Indeed, empirical data have shown autonomic underactivity in children and adolescents with CD who are characterised as CU or psychopathic (for a review see Lahey *et al.*, 1993). Therefore, it seems reasonable to assume that such autonomic underactivity might form the basis for deficits in the capacity for vicarious arousal (i.e. physiological underpinnings of empathy) in CD/CU.

v) Measures employed to assess affective empathy

A final critical factor that may be implicated in the inconsistencies across studies is the measures employed to assess affective empathy. The lack of agreement in study 1 between self-report measures (of emotional state in response to evocative episodes and questionnaire data) and direct indices of vicarious arousal indicates that studies using these indirect measures do not tap the capacity to get vicariously aroused per se, at least in the 'typically-developing' child. If the 'typically-developing' child's capacity to get vicariously aroused is not adequately tapped by self-report measures, then studies utilising self-report measures to compare this capacity in CD and 'typically-developing' children might have led to false conclusions. For example, self-report measures have been found to be vulnerable to social desirability (Eisenberg *et al.*, 1989a; Eisenberg *et al.*, 1989b), and to be influenced by introspective and verbal skills (Chisholm & Strayer, 1995; Eisenberg & Fabes, 1990). CD children have shown both diminished susceptibility to behaving in socially desirable ways (e.g. Cohen & Strayer, 1996), and also inferior verbal skills (see Moffitt, 1993a). Therefore the deficits in affective empathy proposed for CD children might be an artefact of the measures used, and it may have led to underestimation of the true capacity for vicarious arousal in the CD children.

Alternatively, some evidence has suggested that the deficits in verbal intelligence that have been implicated in CD (Moffitt, 1993a) apply specifically to CD/cu children (Loney et al., 1998). If so, then it is probable that assessing the capacity for vicarious affective arousal using verbal measures leads to underestimation in specifically, the CD/cu children.

Consequent upon these lines of concern about the operationalisation of the term empathy, the heterogeneity of the targeted population and the validity of previous research methods, the aim of this study was to examine several predictions concerning the vicarious affective responsiveness across 2 subgroups of CD children: i) CD/CU, ii) CD/cu, and; an age-matched 'typically-developing' control group.

These three groups were compared on two measures of vicarious affective responsiveness on the same evocative episode (short film).

1. Patterns of Heart Rate (HR) in response to the emotionally evocative episode.

2. Verbal self-reports of vicarious affective responsiveness on the same evocative episode.

The inclusion of the verbal report of vicarious arousal would allow test of plausible dissociation between autonomic vicarious arousal and conscious awareness of this arousal in any tested group. In addition to these measures, a further measure of affective empathy was used, the *Bryant Empathy Index* (1982), which is the most widely used measure of affective empathy in children. Inclusion of this measure in conjunction with the direct index of vicarious affective arousal would allow to determine whether this measure does not just fail to give accurate information as to whether affect is aroused in the observer (as indicated in the findings of study 1) but whether, in relation to the direct index, if used for group comparison purposes underestimates the actual capacity for vicarious affective arousal in any particular subgroup of children who may be more vulnerable to the pitfalls of verbal measures.

On the basis of the line of reasoning described above, several hypotheses were formed for each of these measures:

Patterns of HR in response to an emotionally evocative episode: It was hypothesised that: a) autonomic hypoarousal, as indicated in lower baseline HR, would apply to the CD/CU group; b) deficits in vicarious affective arousal, as indicated by i) lower HR in response to the emotionally evocative episode, and ii) smaller magnitude of change in HR from the baseline to the evocative episode, would apply only to the CD/CU group.

Verbal self-reports of vicarious affective responsiveness on the same evocative episode and *Bryant Empathy Index* (1982): It was hypothesised that compared to HR measures, these verbal self-report measures would underestimate the vicarious affective arousal of: a) CD children generally due to their diminished tendency to behave in socially desirable ways (Cohen & Strayer, 1996) and/or diminished verbal skills (see Moffitt, 1993a), or; b) only of CD/cu children on the basis of some evidence supporting the claim that the deficits in verbal skills that have long been implicated in CD are more specific to CD/cu children (Loney *et al.*, 1998).

3.3. Method

3.3.1 Participants

The study sample (N=93) comprised three groups of children: i) CD/CU (n=31, age range 7.6-10.8); ii) CD/cu (n=29, age range 7.6-10.8), and; iii) age-matched 'typically-developing' controls (n=33, age range 8-10). Given the restricted time limits, as the measures and procedures of study 1 and study 2 were identical, the data of the 29 of the controls who participated in the study 1 were used. Only 4 new control children were recruited. All participants were White, English speakers and were recruited from state schools in Glasgow and surrounding areas. Procedures for CD sample collection and the group formation are described below.

Conduct-Disordered (CD) sample selection and group formation

i) Identification of children meeting the criteria for conduct disorder

The CD sample was recruited from four special schools for children with Emotional and Behavioural Difficulties (EBD). Three schools offered day special education

programmes and one offered residential intervention. Within each school a CD sample was identified for follow-up assessment on the basis of their evaluation on the conduct difficulties Rutter Teacher Scales for school-age children (Hogg, Rutter, & Richman, 1997). This was completed by two informants: The individual child's form teacher and a staff professional specialised in social work. These professionals had daily contact with the children, regular contact with their parents, and access to extensive information contained in their files. The correlation of the conduct difficulty subscales scores assigned by the two informants suggested reasonable consistency (r = 0.68, p<0.001). Information from these two informants was combined using the approach recommended by Piacentini, Cohen and Cohen (1992, p.51) in which 'a symptom is considered to be present if it is endorsed by any single informant'. The children who presented at least three symptoms during the last six months were selected for follow-up assessments.

ii) Conduct-disordered group formation

The children who were initially selected, based on meeting the criteria for CD, were further screened to identify: a) a group of CD children characterised by an elevation on the Callous-Unemotional (CU) subscale of the *Psychopathy Screening Device* (PSD; Frick & Hare, in press), and; b) a group that scored low on this measure. In a similar fashion to the conduct difficulties Rutter subscale, the CU subscale was completed by the individual child's form teacher and a staff professional specialised in social work. Consistent with the procedure used to combine informants on the Rutter Scale (procedure recommended by Piacentini *et al.,* 1992), composite scores were formed from the highest rating on each item. CD children, whose score on the CU subscale fell in the upper quartile of the screened sample, were placed in the CD group high on CU traits (CD/CU). CD children whose score fell on, or below, the 50th percentile of the screened sample were placed in the CD/cu group.

Thus using this method of CD group formation, the study sample comprised 3 groups:

i. A CD group that met the criteria for CD and were elevated on the CU subscales (CD/CU).

ii.   A CD group that met the criteria for CD but scored low on the CU subscale (CD/cu).

iii.   A 'typically-developing' control group.

Some CD children presented with a variety of additional symptoms (e.g. opposition defiant disorder (ODD), attention deficit and hyperactive symptoms (ADHD), Asperger's syndrome; see table 3.6).

Table 3.6. Description of the Sample Characteristics

	CD/CU (n= 31)	CD/cu (n=29)	Controls (n=33)
Mean Age (Range)	9.37 (7.6-10.8)	9.29 (7.6-10.8)	9.05 (8-10)
Number of girls	1	2	15
Number of participants from			
EBD day schools	12	20	0
EBD residential school	19	9	0
Mainstream	0	0	33
Median score on CU traits (IQR)	10 (2)	5 (2)	NA
Median score on degree of conduct problems (IQR)	17 (3)	8 (6.5)	NA
Number of participants with			
Asperger's syndrome	4	2	0*
ADHD diagnosis	8	5	0*
ODD diagnosis	6	5	0*

CD/CU= Meeting the diagnostic criteria for CD (determined by the Revised Rutter Teacher conduct difficulties subscale (Hogg, Rutter, & Richman, 1997) elevated (upper quartile) on Unemotional traits; CD/cu = meeting the criteria for CD without elevated (50th percentile or lower) Unemotional traits; Unemotional Traits, were determined by the Callous Unemotional subscale of Psychopathy Screening Device (PSD; Frick and Hare in press); EBD=Emotional and Behavioural Difficulties; ADHD= Attention Deficit and Hyperactive Disorder; ODD= Oppositional Defiant Disorder; ADHD and ODD diagnosis was determined by diagnostic information contained in their files; CU= Callous Unemotional; NA=Not Applicable, IQR = Interquartile Range
*On the basis of the information contained in the children's school-files.

3.3.2. Measures

3.3.2.1 To identify Conduct-disordered (CD) children and to compare CD subgroups

Conduct difficulties subscale of the *Revised Rutter Teacher Scales for school-age children* (Hogg, Rutter, & Richman, 1997):

The Rutter scales were developed over a series of studies in the UK as screening and research instruments to detect conduct problems among children aged 3-16. There is a set of items on four different subscales (i.e. conduct difficulties, inattention/hyperactivity, emotional difficulties, prosocial tendencies). In the present study the 10-item conduct difficulties subscale was used. The full list of items on the scale is given in Appendix 3.

The Rutter scales have the advantage of having been widely used and evaluated. Data on the validity and reliability of these scales are reported in Elander and Rutter (1996). Reviewing the psychometric information available on the scales Elander and Rutter reached the conclusion that 'the evidence about reliability and validity is generally positive, especially for the teachers' scale and the conduct disorder subscale' (Elander & Rutter, 1996, p.63). In the present sample the correlation between the two informants' reports was 0.70.

The Rutter scales are fairly brief to complete yet correlate well (see Hogg, Rutter & Richman, 1997) with the *Child Behaviour Checklist* (Achenbach & Edelbrock, 1983), a worldwide used, much longer scale assessing the same range of behaviours.

Psychopathy Screening Device (PSD; Frick & Hare in press):

The PSD is a 20-item rating scale developed to measure CU traits, narcissism and poor impulse control in children. Each item on the PSD is scored 0 (Not at all true), 1 (Sometimes true) or 2 (Definitely true). Three different subscales deriving from factor analysis (Frick, Bodin & Barry, 2000a) have been developed: a 6-item 'Callous-Unemotional' (CU) factor tapping unemotional interpersonal style (e.g. is unconcerned about the feelings of others); a 6-item 'Narcissism' factor tapping narcissistic traits (e.g. thinks s/he is more important than others), and; a 5-item

'Impulsivity' factor taping impulsive behaviours (e.g. 'Acts without thinking'). The full list of items on the factors is given in Appendix 4.

Data on the validity and reliability of the PSD scales are reported elsewhere (e.g. Frick *et al.*, 1994b; Frick *et al.*, 2000a). In the current sample, the correlations of the ratings of the two informants were 0.69 for total PSD score, 0.60 for the CU scale, 0.62 for the narcissism scale and 0.67 for the impulsivity scale suggesting reasonable consistency.

3.3.2.2. To compare the two CD subgroups with 'typically-developing' controls.

Heart Rate (HR):

Electrocardiogram (ECG) data were collected every 15 milliseconds while watching the film, and recorded online into a computer for subsequent computing of HR.

Verbal self-report of emotion:

Following viewing of the film in the procedure described in section 2.6.2.5. verbal self-reported emotional reactions to the evocative episode were obtained.

Bryant Empathy Index (1982):

The *Bryant Empathy Index for children and adolescents* (Bryant, 1982) derived from the Mehrabian and Epstein (1972) empathy measure for adults. This instrument is a 22-item questionnaire that requires young children to agree or disagree with a series of statements read by the investigator (e.g. 'seeing a boy who is crying makes me feel like crying' (see Appendix 2).

Word Definitions Test of the British Ability Scales II:

The *Word Definitions Test of the British Ability Scales II* was included as a control measure to examine whether any group differences in verbal self-report measures could partly be explained by differences in verbal ability.

3.3.3. Experimental setting, materials and equipment for the laboratory assessment.

The experimental setting for the laboratory assessment was identical to that of study 1 described in section 2.6.2.5.

3.3.4. Procedure

Familiarisation with Conduct-Disordered (CD) children

Familiarisation with CD children was considered to be important given the nature of their difficulties. Within a period of two months, and before conducting any assessments, two working days a week were spent by the investigator in each EBD participating school. By being involved in the children's daily activities, a degree of familiarity was gained. Familiarisation prior to assessment was not considered to be required for the comparison group.

Identification of children meeting the criteria for Conduct Disorder (CD) and group formation

Upon obtaining parental consent, and during the period of familiarisation with the children in EBD schools, two informants for each child (the individual child's form teacher and a staff professional who specialised in social work) were submitted the *Revised Rutter Teacher Conduct Difficulties Subscale for school-age children*. This subscale was used for initial identification of the children who met the criteria for CD.

The initial sample that met the criteria for CD were further screened to identify a group characterised by an elevation on the CU subscales of the PSD (Frick & Hare, in press) as well as a group that scored low on this measure. In a similar fashion to the conduct difficulties Rutter subscale, each child's form teacher and a staff professional specialising in social work served as informants.

The CU subscale as well as the conduct difficulties Rutter subscale described above were given to the informants to complete in their own free time. They were asked to follow the instructions on the scale itself and return them within a period of three weeks. Items were rated on the basis of each individual child's behaviour in the past

six months or during the current academic year. Each scale took approximately five minutes to be completed.

Administration of the PSD subscales to the informants

Once the CD groups were identified, the two informants were submitted the narcissism and impulsivity subscales of the PSD.

The PSD subscales were given to the informants to complete in their own free time. They were asked to follow the instructions on each scale itself and return them within a period of three weeks. Items were rated on the basis of a child's behaviour in the past six months or during the current academic year. The PSD scales took approximately five minutes respectively to be completed.

Laboratory Assessment

Each child was tested individually at the department's psychophysiological laboratory on a session that lasted around 30 minutes. This assessment was identical to that of study 1. The description of the procedure can be found in section 2.6.2.6.

Administration of the *Bryant Empathy Index* (1982)

The *Bryant Empathy Index* (Bryant, 1982) was administered to CD children on an individual basis in a quiet room of their school. For the control group, the *Bryant empathy Index* was administered on the same session with the laboratory assessment. The 22 items of the questionnaire were read aloud and the child responded verbally, indicating whether the statement was 'like me' or 'not like me'. In the event of difficulty, questions were re-read a maximum of three times.

Assessment of Verbal Ability

In all three groups, the *Word Definition Test of the British Ability Scales II* (1996) was administered to the children on an individual basis in a quiet room of their school. For the administration of this scale, the detailed instructions of the Administration Manual (Elliot, Smith & McCulloch, 1996) were followed. Responses were noted verbatim but also tape-recorded for subsequent analysis. During administration, tentative scores were assigned in order to use the Decision

Point and Alternative Stopping Point rules (for details see Appendix 6). This assessment took around 15 minutes depending on the child's verbal ability.

The order of: i) the laboratory assessment; ii) the administration the *Bryant Empathy Index,* and; iii) *Word Definition Test of the British Ability Scales II* was counterbalanced across participants.

3.3.5. Data Coding / Scoring/Analysis

Analysis of Heart Rate (HR)

The acquired ECG data files were edited using the *Acknowledge 3.5.3* software. Editing the files consisted of scanning the data for outlier points relative to adjacent data, and replacing these points with the average of the codable beat immediately before and after the outlier.

With the use of Acknowledge 3.5.3 software, from the acquired ECG data (sampled every 15mseconds) HR (in Beats Per Minute, BPM) was computed. Data were then extracted to Excel data files, where mean HR (BPM) was computed.

In study 1, HR data showed consistency across all 8 evocative episodes. On the basis of this consistency and given the elaborate nature of physiological data analysis, it was judged adequate for the purposes of study 2 to analyse the data of a single evocative episode. Therefore for each child, HR was analysed across the fourth evocative episode of the film (see section 2.6.2.7). This specific episode was chosen as this was the one that at the selection phase of the episodes (see section 2.6.2.3.) was judged by the group of 15 judges to be the most evocative. Baseline HR was analysed for each child using the 10 seconds of neutral content immediately preceding the evocative episode.

Coding of verbally-reported vicarious responsiveness

Children's verbally-reported vicarious responsiveness on the analysed evocative episode were coded to yield frequency data. Each child's response was coded as yes or no- indicative/or not of verbally-reported vicarious responsiveness. 'Yes' denoted an exact match, or of equal valence emotion with that of the protagonist. 'No'

denoted no emotion or a discordant (opposite valence) emotion reported by the participating child.

Scoring the *Bryant Empathy Index* (1982)

On each of the 22 items empathic responses scored 1 and non-empathic responses scored 0, raising a maximum potential score of 22.

Scoring the *Word Definition Test of the British Ability Scales II*

During administration, tentative scores were assigned in order to use the Decision Point and Alternative Stopping Point rules. After testing, the detailed scoring procedure suggested by the Administration and Scoring Manual of the British Ability Scales (Elliot *et al.*, 1996) was followed. Age-corrected T-scores were used in the analysis of the data. Details on this scoring procedure can be found in Appendix 6.

3.4. Results

3.4.1. Statistical analysis

Descriptive Statistics: For data that were normally distributed and for which the equality of variance assumption was met, mean scores and Standard Deviations (SD) are presented. For data that were not normally distributed and/or for which the equality of variance assumption was violated, the Median scores and the Interquartile Range (IQR) are presented.

Inferential Statistics: For data that were normally distributed and the equality of variance assumption was met, the within-subject differences on the various factors were determined by using ANOVA for repeated measures or related t-tests for the pairwise comparisons. The between-subject differences were determined by between-subjects ANOVA followed by Tukey's HSD procedures for the pairwise comparisons. For data that were highly skewed or for which there was a marked heterogeneity of variance, non-parametric tests - which assume neither homogeneity of variance nor a normal distribution - were employed. Kruskal-Wallis test followed by Mann-Whitney U tests for the pairwise comparisons were used to examine group differences. Wilcoxon Matched Pairs Signed-Ranks tests were employed to

determine within subject/group differences. For data that did not meet the assumptions behind a normal ANOVA design but involved more than two levels of a factor the Epsilon statistic was employed for correction of the violations of the assumptions behind a normal design. This was followed by Games and Howell (1976) post-hoc comparisons. The Games-Howell procedure was considered to be appropriate as it has been specifically proposed for dealing with heterogeneity of variance and unequal sample sizes.

Frequency data were analysed using the chi-square (χ^2) statistic. In the special cases of 2*2 contingency tables, when the expected frequencies were less than 5, the Fisher's Exact Test was utilised as an alternative to the chi-square.

Table 3.7. Outline of the statistical tests used to test the main hypotheses

	Test for comparison across the three groups	Test for pairwise or post-hoc comparisons
Baseline HR	Kruskal-Wallis	Mann – Whitney U
HR during the evocative episode	Kruskal-Wallis	Mann – Whitney U
Magnitude of HR change from the baseline to the evocative episode	Kruskal-Wallis	Mann – Whitney U
Self-reported emotional state in response to the evocative episode	Chi-square (χ^2)	Chi-square (χ^2)
Bryant Empathy Index	Between-subjects ANOVA	Tukey's HSD

3.4.2. Demographic variables and verbal ability

To evaluate the equivalence of the three groups (i.e. CD/CU, CD/cu, control group) a comparison was made of the following variables: age, gender, and expressive language. The results of these analyses are presented in Table 3.8.

With both CD groups consisting predominantly of males, there was a significant overall difference in gender ($x^2_{(2, 93)}$= 22.45, p < 0.001). The CD groups did not differ from each other with respect to gender.

112

Skewness of the data on the measure of expressive language was 1.079 (0.421) for the CD/CU group, 0.719 (0.434) for the CD/cu group and 1.806 (0.409) for the control group. As revealed by a Kruskal-Wallis test, the three groups differed on the measure of expressive language ($x^2_{(2, 93)}$=7.401, p<0.025). Follow-up, pairwise comparisons using Mann-Whitney U tests showed that the control group exceeded the CD/cu on the expressive language measure (z = -2.695, p<0.007). The CD/CU group had lower expressive language scores than the control group and higher scores than the CD/cu group, but these differences were not significant. The three groups did not differ with respect to age.

Table 3.8. Group comparisons on gender, age, and expressive language

	CD/CU	CD/cu	Control	Statistic	p
Gender. N (% male)	30 (97)	27 (93)	17 (55)	$x^2_{(2, 93)}$= 22.45	p < 0.001
Age. Mean years (SD)	9.37(1.18)	9.29 (0.92)	9.18 (0.65)	$F_{(2, 90)}$=0.305	n.s.
Expressive Language. Median score (IQR)	92 (19)	88 (18.5)	98 (10.5)	$x^2_{(2)}$=7.401	p < 0.025

CD/CU= Meeting the diagnostic criteria for CD (determined by the Revised Rutter Teacher conduct difficulties subscale (Hogg, Rutter, & Richman, 1997) with elevated (upper quartile) CU traits; CD/cu = meeting the criteria for CD (determined by the Revised Rutter Teacher conduct difficulties subscale (Hogg, Rutter, & Richman, 1997) low (50th percentile or lower) on CU traits. N= Number; IQR = Interquartile Range; SD= Standard Deviation; Expressive language was determined by the WD-BASII =Word Definition Test - British Ability Scales II;

3.4.3. Comparison of the two CD groups on clinical profile

The two CD groups were compared on the degree of their conduct problems (determined by the Rutter Conduct-Difficulties subscale), narcissism (PSD subscale), impulsivity (PSD subscale) and psychopathic tendencies (PSD total score). Table 3.9. presents the degree of skewness for each data set.

Table 3.9. Skewness of CD groups data on the degree of conduct problems, psychopathic tendencies, narcissism and impulsivity

	CD/CU	CD/cu
Degree of Conduct Problems. Skewness (S.E.S)	-1.440 (0.421)	0.575 (0.441)
Psychopathic Tendencies. Skewness (S.E.S)	-0.892 (0.421)	-0.158 (0.441)
Narcissism. Skewness (S.E.S)	-0.742 (0.421)	-0.200 (0.441)
Impulsivity. Skewness (S.E.S)	-2.266 (0.421)	-0.175 (0.441)

S.E.S: Standard Error of Skewness

As shown in Table 3.10, the two groups differed significantly in the degree of their conduct problems (determined by the Rutter Conduct-Difficulties subscale, narcissism (PSD subscale), impulsivity (PSD subscale) and psychopathic tendencies (PSD total score). The CD/CU group exceeded the CD/cu group in the degree of conduct problems (z =-5.261, p<0.001, two-tailed), narcissism (z =-5.029, p<0.001, two-tailed), impulsivity (z =-5.907, p<0.001, two-tailed) and in the psychopathic tendencies (z =-6.305, p<0.001, two-tailed). The two groups did not differ significantly in Asperger's syndrome, ADHD and ODD diagnosis (on the basis of diagnostic information contained in their files).

Table 3.10. Comparison of CD groups on the degree of conduct problems, psychopathic tendencies, narcissism, impulsivity, Asperger's syndrome, ADHD and ODD diagnosis

	CD/CU	CD/cu	Statistic	p
Degree of Conduct Problems. Median (IQR)	17 (4)	8 (6.5)	Z =-5.261	p<0.001
Psychopathic Tendencies. Median (IQR)	33 (3)	18 (9.75)	Z =-6.305	p<0.001
Narcissism. Median (IQR)	11 (3)	7 (4)	Z =-5.029	p<0.001
Impulsivity. Median (IQR)	10 (2)	6 (4)	Z =-5.907	p<0.001
Asperger's syndrome. N(%)	4	2	Fisher's Exact (two-tailed)=0.26	n.s
ADHD diagnosis . N(%)	8 (25.81)	5 (17.24)	x^2=0.24	n.s
ODD diagnosis. N (%)	6 (19.35)	5 (17.24)	x^2=0.01	n.s.

CU Traits, Narcissism and Impulsivity were determined by the PSD subscales. The psychopathic tendencies were determined by the Psychopathy Screening Device (PSD; Frick & Hare in press). The degree of conduct problems was determined by the Revised Rutter conduct difficulties subscale. Asperger's syndrome ADHD and ODD diagnosis was determined by diagnostic information contained in their files.

3.4.4. Heart Rate (HR) at baseline and during exposure to the emotionally evocative episode

The descriptive statistics and skewness for HR in each group during baseline and during the evocative episode are presented in table 3.11. As illustrated in Figure 3.1, the CD/CU group displayed lower HR relative to the other two groups, during both the baseline condition and the evocative episode. HR increased for all groups between baseline and evocative episode. The magnitude of change in HR from the baseline to the evocative episode is smaller in the CD/CU than in each of the other two groups.
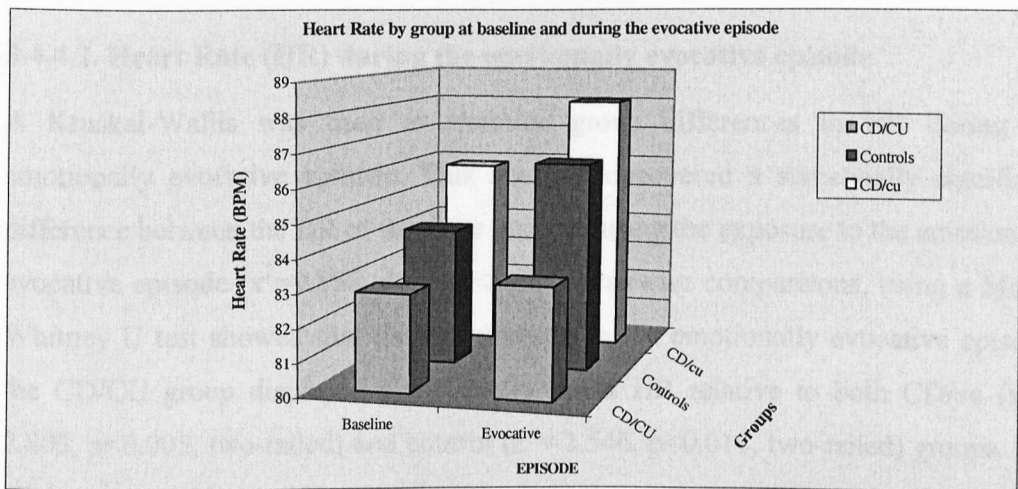
Figure 3.1. Patterns of HR in the three groups during baseline and emotionally evocative episode

Table 3.11. Descriptive statistics and skewness for HR in the three groups during baseline and evocative episode

Group	Episode	Median	IQR	Skewness (SES)
CD/CU	Baseline	82.91	14.36	1.067 (0.421)
	Evocative	83.30	17.51	0.896 (0.421)
CD/cu	Baseline	85.82	24.85	1.525 (0.434)
	Evocative	88.01	22.16	2.041 (0.434)
Control	Baseline	84.17	18.23	1.681 (0.409)
	Evocative	86.35	19.49	2.168 (0.409)

Note: Median scores are expressed in BPM (Beats per Minute); IQR = Interquartile range; SES=Standard Error of Skewness

3.4.4.1. Baseline Heart Rate (HR)

To examine whether there were significant differences between the groups in terms of baseline HR, a Kruskal-Wallis test was used. This analysis revealed a significant difference between the baseline HR of the three groups ($x^2= 6.158$, df =2, p< 0.046). Pairwise comparisons, employing Mann-Whitney U test showed that the CD/CU group displayed significantly lower HR than both the CD/cu (z =-2.167, p<0.030, two-tailed) and control (z =-2.116, p<0.034, two-tailed) groups. The CD/cu group did not differ significantly from the controls in baseline HR.

3.4.4.2. Heart Rate (HR) during the emotionally evocative episode

A Kruskal-Wallis was used to examine group differences in HR during the emotionally evocative episode. This analysis uncovered a statistically significant difference between the HR of the three groups during the exposure to the emotionally evocative episode ($x^2=9.858$, df=2, p<0.007). Pairwise comparisons, using a Mann-Whitney U test showed that during exposure to the emotionally evocative episode, the CD/CU group displayed significantly lower HR relative to both CD/cu (z =-2.803, p<0.005, two-tailed) and control (z =-2.546, p<0.011, two-tailed) groups. The CD/cu group did not differ significantly from the controls in HR during exposure to the emotionally evocative context.

3.4.4.3. Magnitude of change in Heart Rate (HR) from the baseline to the evocative episode

The first question was whether a significant change would occur in the magnitude of HR change from the baseline condition to the evocative episode. A Wilcoxon Matched Pairs Signed-Ranks, performed on the total sample (i.e. irrespective of group membership), uncovered a statistically significant increase in HR from the baseline to the evocative episode (z =-3.538, p<0.001, two-tailed).

Given this overall increase in HR from baseline during the evocative episode, HR change scores were computed for each participant. This was achieved by subtracting the baseline HR from HR during the evocative episode to yield a change score for

each participant. A Kruskal-Wallis was conducted, using the HR change scores. This analysis showed a statistically significant difference between the three groups in the degree of HR change from the baseline to the evocative episode (x^2=7.390, df=2, p<0.025). Pairwise comparisons, using a Mann-Whitney U test showed that the CD/CU group displayed significantly lower HR change than both CD/cu (z =-2.537, p<0.011, two-tailed) and control (z =-2.008, p<0.045, two-tailed) groups. The CD/cu did not differ significantly from the controls in the magnitude of HR change.

3.4.5. Verbally-reported affective empathy

A chi-square performed on the frequency data (i.e. each child's response was coded as yes or no- indicative/or not of verbally reported vicarious responsiveness; see table 3.12) uncovered a statistical significant difference between the three groups in the frequency of verbally reported vicarious responsiveness (x^2=7.71, df =2, p<0.05). Subsequent, pairwise comparisons found that controls were significantly more likely than the CD/CU (x^2=5.53, df =1, p<0.05) and CD/cu (x^2= 4.1, df =1, p<0.05) groups to verbally report a vicarious response. The two CD groups did not differ in the frequency of verbally-reported vicarious responsiveness.

Table 3.12. Frequency of verbally-reported affective empathy

	CD/CU	CD/cu	Controls
Verbal response	17	17	28
No verbal response	14	12	5

N on table indicate the frequency in which a verbal response was/was not elicited

3.4.6. Bryant Empathy Index

A one-way between-subjects ANOVA was performed on the mean *Bryant Empathy Index* questionnaire scores. Mean score for the CD/CU group was 10.84 (S.D.=2.77), for the CD/cu group was 10.76 (S.D.=3.08) and for the control group was 12.88 (S.D.=2.88). A statistically significant difference between the three groups ($F_{(2, 90)}$ = 5.446, p<0.006) was found. Follow-up pairwise comparison with Tukey's HSD procedures found that the control group scored significantly higher than both the

117

CD/CU (p<0.017) and CD/cu (p<0.014) groups. The two CD groups did not differ from each other with respect to their scores on the *Bryant Empathy Index.*

3.5. Discussion

3.5.1. Summary of results

The present study employed 3 groups of children: i) CD/CU; ii) CD/cu, and; iii) age-matched 'typically-developing' controls. These groups were compared on three measures of affective empathy: 1) Patterns of HR in response to an emotionally evocative episode; 2) Verbal self-reports of vicarious affective responsiveness on the same evocative episode, and; 3) The *Bryant Empathy Index* (1982). Findings in summary were as follows:

1) The CD/CU group displayed lower HR compared to both the CD/cu group and the control group at baseline and during the evocative episode. The CD/CU group also showed a smaller magnitude of HR change from the baseline to the evocative episode relative to the other two groups. The CD/cu group and the control group did not differ on this measure of cardiac activity, either at the baseline or during the evocative episode or in the magnitude of HR change from baseline to the evocative episode.

2) In contrast to the direct measure of vicarious arousal, the self-reports differentiated between controls and CD children but not between the two CD subgroups. Controls were more likely than both CD subgroups to verbally report a vicarious affective response to the affective state of the protagonist. The two CD groups did not differ from each other on the frequency of verbally-reported a vicarious responsiveness.

3) In a similar fashion to the verbal reports of vicarious affective responsiveness, the *Bryant Empathy Index* differentiated between controls and CD children but not between the two CD subgroups. Controls scored significantly higher on the *Bryant Empathy Index* than both CD subgroups. Again the two CD subgroups did not differ from each other on this measure.

3.5.2. Affective empathy as indicated in physiological measures (Heart Rate)

3.5.2.1. Affective empathy in CD/CU children

The findings of the present study for CD/CU provide support for the view that links CD with deficits in affective empathy. Such a link has been previously supported by other investigations (e.g. Cohen & Strayer, 1996). The present study, however, has been one of the few to examine the hypothetical link between CD and affective empathy, utilising a direct measure of the capacity to get vicariously aroused, (i.e. patterns of HR in response to an emotionally evocative episode) rather than relying on indirect measures, such as self-report questionnaires, whose validity has been questioned (see section 2.6.1.1).

In a recent study with a much younger sample (aged 2-3 years), by Calkins and Dedmon (2000), which employed similar procedures to those of the current investigation, HR was significantly increased from the baseline to the evocative episode (crying infant). But this effect was irrespective of the risk group (i.e. 'high-risk' vs. 'low-risk') group for developing CD. Similarly, in an older sample (aged 4-5 years), Zahn-Waxler and colleagues (Zahn-Waxler *et al.*, 1995) found no differences between the patterns of HR during the evocative episodes between children at high moderate and low risk for developing CD. The results of this particular study, however, would need to be interpreted with caution. As discussed above (see section 3.2.5) although the three groups differed from each other on the externalised scales, classification of risk groups was based on combined internalising and externalising symptoms of the *Child Behaviour Checklist* (Achenbach & Edelbrock, 1983, 1986). It should be noted that in this study (i.e. by Zaxn-Waxler *et al.*, 1995), when the role of externalising symptoms was examined by controlling on internalising, low HR and SC during the evocative episodes were associated with the externalising symptoms.

One conclusion to be drawn from the studies by Zahn-Waxler *et al.* (1995) and Calkins and Dedmon (2000) is that the link between deficits in vicarious affective arousal and CD does not appear to be robust at this early stage in development. This conclusion is not easily reconciled with the present findings.

There are two plausible explanations for the inconsistent findings between the previous and the current investigations. Firstly, it may be the case that the relationship between CD and the capacity for vicarious affective arousal, as indicated in HR patterns, changes with development. Indeed, it has been proposed that the relationship between autonomic nervous system functioning, as indexed by HR and SC measures, and antisocial conduct, changes across the developmental course of a child's life (Mezacappa et al., 1996). This may perhaps partially be a function of early environmental experiences (Raine, 1996).

A second explanation for the inconsistent findings between the current investigation and those by Zahn-Waxler et al. (1995) and Calkins and Dedmon (2000) is that children's conduct problems may be of various types and may reflect different developmental pathways and processes (Cichetti & Rogosch, 1996; Moffitt, 1993b). This explanation is supported by current findings which suggest that subgroups of CD children (in the examined age range - i.e. 7.6 -10.8 years) show differentiated patterns in the capacity to get vicariously aroused. The present results suggest that deficiencies in vicarious affective arousal, that have been integral in many causal theories of CD, may only be characteristic of a subgroup of children with persistent conduct problems, namely, those who show CU traits. These results support the view that the conduct problems of children exhibiting CU traits seem to be related to a different causal mechanism than the conduct problems of children lacking these personality traits (see Frick, 1998a).

The reduced vicarious arousal documented in the present study for CD/CU children, in line with predictions, was accompanied by autonomic hypoarousal (as indexed by HR) at baseline. Other studies, that did not focus on specific subgroups of children with conduct problems, have been inconsistent in finding baseline physiological correlates underlying conduct problems. For instance, Eisenberg, Fabes, Guthrie, Murphy, Maszk, Holmgren, and Suh (1996a), found only a modest relationship between low baseline HR and the incidence of problem behaviour (based on parents' reports) in a normative sample of elementary school boys. Zahn-Waxler and colleagues (Zahn-Waxler et al., 1995) reported no differences in the baseline measures of HR in 'high-risk' (for developing CD) preschoolers (aged 4-5 years) in

comparison with low-risk groups. While Calkins and Dedmon (2000), extending the age downwards, reported no difference between high (for developing CD) and low-risk groups on baseline measures of HR in toddlers aged 2 to 3.

On the other hand, studies that have focused on specific subgroups of CD children and adolescents have reported that subgroups of undersocialised, aggressive, psychopathic and/or CU youths with CD consistently exhibit lower baseline HR and diminished electrodermal response in comparison with controls (Borkovec, 1970; Raine & Venables, 1984; Raine, Venables & Williams, 1990a; Schmidt, Solanto & Bridger, Delamater & Lahey, 1983; Raine & Jones, 1987; Wadsworth, 1976; Siddle, Nicol & Forgitt, 1973). These findings appear to be consistent with those of the present investigation, in which CD/CU children, (a group that would conform to many of the past definitions of the undersocialised-aggressive type proposed by DSM-III (American Psychiatric Association, 1980; see Frick & Ellis, 1999), showed significantly lower baseline HR relative to typically-developing controls.

More importantly, prospective longitudinal studies (Davies & Maliphant, 1971; Raine et al., 1990a; West & Farrington, 1977) have documented that lower baseline HR predicted serious criminal behaviour, particularly aggressive crime, at a later age. Raine and colleagues (1990a), found that lower HR and SC (measured at age 15 in 101 non-referred boys) predicted criminal convictions between 15 and 24 years of age. Time of prediction is extended backwards by West and Farrington (1977) in an early large-scale study with non-referred boys in which low baseline HR measured at age 11 predicted adult criminal behaviour. In a further longitudinal study by Raine, Venables and Mednic-Sarnoff (1997) the time of prediction is pushed further back by 8 years. Low HR at the age of 3 was found to predispose children to antisocial conduct at age 11. However, in a subsequent longitudinal study Van Hulle, Corley, Zahn-Waxler, Kagan & Hewitt (2000), failed to establish this link in an even younger group. In their sample of toddlers (aged 1-3 years), low HR was not predictive of CD at the age of 7.

Several theoretical accounts have been proposed in an attempt to address the mechanisms and processes that underlie the link between autonomic hypoarousal and/or diminished vicarious arousal and serious patterns of antisocial conduct. The

stimulation-seeking theory (summarised in Eysenck & Gudjohnsson, 1989) argues that the common biological condition underlying serious patterns of conduct problems involves the inheritance of a nervous system which is relatively insensitive to low levels of stimulation. It is argued that individuals with such a physiotype, will be extraverted, impulsive, and sensation seeking because under conditions of relatively low stimulation they find themselves at a suboptimal level of arousal which is aversive. To increase their arousal, many will participate in high-risk activities. Antisocial conduct may be viewed as a form of stimulation-seeking in that behaviours such as outbursts of anger, fighting, swearing and cruelty could be stimulating for some children (Raine *et al.*, 1997)

A second theory addressing the link between CD and reduced arousal is the fearlessness theory which indicates that low HR is a marker of a fearless personality (Raine 1993; 1996). Lack of fear would predispose an individual to antisocial and violent behaviour because such behaviour (e.g. fights and assaults) requires a degree of fearlessness to execute. Lack of fear, especially in childhood, would help to explain poor socialization since low fear of punishment would reduce the effectiveness of social conditioning.

A third theory, more specific to reduced vicarious affective arousal, is Hoffman's (1975; 1977; 1982) model of inhibition of antisocial conduct by means of vicarious affective arousal. This has found support from other empathy theorists such as Feshbach & Feshbach (1982). Hoffman suggests that, in the 'normally' developing child, the observation of another's expression of distress or pain results in the experience of similar distress by means of vicarious affective responding. Reduction of aggressive behaviour in the interaction with other individuals would therefore be reinforcing for the aggressor because it would result in lessened negative vicarious arousal (Feshbach, 1978; Feshbach & Feshbach, 1982). Based on this line of reasoning, it would be reasonable to assume that an individual with a hypoaroused nervous system would be less activated by distress cues of another person. Consequently, s/he would be less likely to inhibit his/her antisocial conduct as s/he will not experience an aversive state that would inhibit the antisocial conduct.

Hoffman's model of inhibition of antisocial conduct dovetails nicely with Hirshleifer's (1987) 'Guarantor' and Frank's (1988) 'Commitment' models of emotion. These models suggest that the reduction in anxiety which follows cooperative or prosocial behaviour reinforces such behaviour. While the increase in anxiety which, through stimulus generalisation, follows acts or thoughts of antisocial behaviour will punish and therefore reduce those acts and thoughts.

In a similar theoretical model, Blair et al., (Blair, Jones, Clark, & Smith, 1995a; Blair, Sellars, Strickland, Clark, Williams, Smith, & Jones, 1995b) suggest that individuals who show a persistent pattern of antisocial conduct do so as a developmental consequence of early dysfunction within the 'Violence Inhibition Mechanism', which is involved in the control of aggression in the normally developing child (Blair, 1995; Blair et al., 1995a; 1995b). The 'Violence Inhibition Mechanism' is conceptualised as a basic emotion mechanism which, when activated by distress cues, initiates a withdrawal or behaviour inhibition response. Blair suggests that repeated pairing of representations of the transgression with the distress cues of the victim of the transgression results in a representation of the transgression becoming, through classical conditioning, a conditioned stimulus for the activation of the *Violent Inhibition Mechanism*. An individual with a deficit within, or with a failure to develop this mechanism, would fail to show arousal responses to the distress cues of the victim and would therefore not inhibit aggression.

It is difficult to establish clear boundaries between theories, especially those that attempt to relate reduced vicarious affective arousal to antisocial conduct (i.e. Hoffman's and Blair's model). It is also difficult to delineate which theory accounts best for the patterns of behaviour exhibited by the CD/CU children. To our knowledge, while there are no empirical data revealing counterarguments to any of the proposed theories, there is a series of findings that can be interpreted as supportive of more than one theory. For instance, in general support of the stimulation-seeking theory, CD/CU children have shown a preference for thrill and adventure seeking activities (Frick et al., 1994b; Frick et al., 1999). At the same time, this finding has been interpreted as being indicative of a lack of fearful inhibition (Frick et al., 1994b; Frick et al., 1999). This evidence might also be used

in support of Hoffman's or Blair's model. CD/CU children have also shown diminished sensitivity to punishment cues (O'Brien & Frick, 1996) and lower anxiety levels (Burry, Frick, DeShazo, McCoy & Ellis, 2000). This could be used as an argument in favour of both Hirshleifer's (1987) 'Guarantor' and Frank's (1988) 'Commitment' role of emotion.

It seems plausible, then, that more than one theory may account for the link between reduced arousal and/or vicarious arousal and persistent antisocial conduct; or even that the theories complement each other. It might be, for instance, that aggression is *a* form of stimulation-seeking (stimulation-seeking theory) by the hypoaroused individual. And further, such individuals experience no aversive arousal during aggression to inhibit the behaviour early in development (Hoffman's model). As the child ages, without the assistance of autonomic conditioning, s/he will remain handicapped in inhibiting antisocial conduct (Blair's model). These, however, are only speculations. Much more refinement in the measurements employed are required to reach to a clearer idea of the mechanism that underlies the link between low vicarious arousal and serious patterns of antisocial conduct.

3.5.2.2. Affective empathy as indicated in physiological measures in CD/cu children

As discussed above, the patterns of results in relation to the direct index of vicarious affective arousal (i.e. increase HR) in CD/CU children appeared to be consistent with the previously reviewed theories emphasising the effect that deficiencies in affective dimensions of empathy can have on children's ability to inhibit antisocial acts. However, if present results are replicated, these theories are hard to reconcile with the lack of deficit in the capacity for vicarious arousal in CD/cu children.

There are at least two plausible explanations for the patterns of findings in this subgroup of CD children, which might interact with each other, namely: **i)** interpretation of vicarious arousal, and; **ii)** differential origin of their conduct problems.

i) Interpretation of vicarious affective arousal

Firstly, it is plausible that the inhibition of antisocial conduct by means of vicarious affective arousal is mediated by the interpretation of this arousal. The finding that CD/cu children do not show deficits in the capacity for vicarious arousal does not necessarily mean that they interpret their arousal as deriving from the affective state of the other person.

The role of cognitive interpretations of experienced arousal is highlighted in a review by Dienstbier (1984) which cites a considerable body of empirical research testing the role of anxiety and emotional arousal on cheating. High arousal levels were associated with low cheating (and vice versa) but the participants' attribution of the cause of high arousal was also important. When participants were able to attribute their arousal to a cause other than the temptation to cheat, they found it much easier to cheat than when they had no other explanation for their level of arousal. Also, participants were less willing to act to avoid punishment when they were able to attribute their arousal to an external cause rather than to an internal source of anxiety associated with the threat of punishment. Dienstbier (1984) reached the conclusion that when a situation is perceived to be 'detection-free', one's temptation to cheat is either resisted or not, depending on the levels of anxiety perceived to be associated with the temptation.

In an analogous fashion, it might be that a significant number of CD/cu children have a diminished tendency, relative to their 'typically-developing' counterparts, to perceive their arousal to be associated with another's affective state. Present verbal-report data have provided some preliminary indirect support for this speculation. In contrast to direct measures of vicarious arousal, that did not show diminished 'capacity' for vicarious arousal in CD/cu children, verbal reports have shown such children to be less likely to report a vicarious response to another's affective state. One plausible interpretation of this finding may be that CD/cu children have a diminished tendency to attribute their arousal to the affective state of another. Alternatively, or additionally, they may show diminished conscious awareness of their vicarious arousal due to perhaps decreased introspective skills, perhaps associated with socialisation practices. Other interpretations, however, are plausible

(i.e. diminished verbal skills, diminished tendency to respond in socially desired way, diminished tendency to reveal inner feelings - see section 3.2.6).

An interesting focus for future investigations would be to examine aggressive responses of CD/cu children in more realistic emotionally arousing situations in an attempt to determine whether: i) they attribute their arousal to a source other than the affective state of the victim of the antisocial act; ii) they show diminished conscious awareness of their vicarious affective arousal, or; iii) the cognitive interpretation of their arousal might even contribute to the antisocial act. For instance, they may attribute their arousal to provocation from the victim, especially in situations perceived as ambiguous. Or, they may attribute their arousal to another's affective state but will not perceive that the victim's affective state is induced by their own acts. As previously discussed (see section 2.3), in Hoffman's model of empathy motivated inhibition of antisocial conduct it is important that the individual perceives that s/he is responsible for the distress caused to the victim.

Whichever of the above hypotheses proves more explanatory, it is conceivable that failure to inhibit antisocial conduct need not preclude the capacity for vicarious arousal. Thus, the inconsistency between the present results of the CD/cu children and the theories predicting a link between vicarious arousal and the inhibition of antisocial conduct seem to suggest that these theories either: i) have failed to adequately account for the significance of the mediating role of the cognitive interpretation and/or conscious awareness of the vicarious arousal, or; ii) do not account for the antisocial conduct of CD/cu children, as discussed below.

ii) Plausible differential origin of CD/cu children conduct problems

A second possible explanation for the lack of deficits in vicarious affective arousal in CD/cu is that the antisocial behaviour of this subgroup of CD children follows a different developmental trajectory. There is evidence to suggest that the failure to inhibit antisocial conduct in CD/cu children is more strongly associated with intellectual deficits and a dysfunctional family background (Christian *et al.*, 1997; Hare *et al.*, 1991). CD/cu children are proposed to be a more diverse group than the

CD/CU children and their failure to develop appropriate behavioural control may have developed through a diverse set of interacting factors (Frick *et al.,* 2000b).

One such factor may be low intelligence leading to difficulty in anticipating the consequences of their behaviour or in delaying gratification (Loney *et al.,* 1998).

A second factor which could explain the failure of a significant number of CD/cu children to develop appropriate behavioural control might be low emotional regulation underlined by low physiological regulation. Low physiological regulation has been consistently linked to externalising psychopathologies even at an early age (e.g. Porges, Doussard-Roosevelt, Portales & Greenspan 1996; Calkins & Dedmon, 2000). An interesting question, that could be addressed in future studies, is whether physiological disregulation is more specific to CD/cu children. Given that emotional regulation refers to processes that serve to manage arousal (Calkins, 1994) and, that in the present study, this subgroup of CD children have shown higher levels of arousal in comparison with CD/CU children, it might be that their lack of behaviour control is highly related to their inability to regulate this arousal. It might be, for instance, that inability to regulate arousal interferes with the accuracy of perception in arousing situations, especially when these situations are ambiguous.

A third contributing factor to the patterns of behaviour exhibited by a significant number of CD/cu children might be the development of a hostile attribution bias, resulting from being raised in an abusive home environment (Dodge *et al.,* 1990). Dodge (1980) found that aggressive boys were more likely than nonaggressive boys to interpret another person's behaviour as aggressive or hostile, especially when the other's intent was ambiguous. More recent evidence suggests that hostile attribution bias may be more specific to children who exhibit reactive rather than proactive aggression (Crick & Dodge 1992; Crick & Dodge, 1996; Dodge & Coie, 1987). At the same time, on the basis of some preliminary evidence (Cornell, Warren, Hawk, Stafford, Oram & Pine, 1996; Kruh *et al.,* in press), it has been suggested that high levels of CU traits are more strongly related to proactive aggression while low levels of CU traits are related to reactive aggression (Frick & Ellis, 1999). This evidence, however, derives from studies with adult and juvenile violent offenders. Also, in both of these studies (i.e.; Cornell *et al.,* 1996, Kruh *et al.,* in press) the proactive forms of

aggression were consistently linked to high levels of the combined score on psychopathic tendencies (i.e. CU traits and low impulse control), and therefore it was unclear which dimension of psychopathic tendencies was more predictive of the type of aggression exhibited. Before more definite conclusions are drawn, the relationship between the form of aggression and high/low CU traits needs to be tested in young and less severely disturbed samples.

A fourth factor which may contribute to CD/cu children's failure to inhibit antisocial conduct might be some deficit in more cognitive dimensions of empathy (i.e. ability to apprehend another's affective state in emotionally arousing situations) in ambiguous (or not) situations. Following Hoffman's developmental model of empathy (see section 2.3), the ability to act intentionally in either a prosocial or antisocial manner depends upon having reached a certain level of cognitive development at which it is possible to accurately interpret another's affective state. It might be that some children who are inclined to respond in an antisocial manner, do so as a result of inappropriate interpretation of others' behaviour or affective state in emotionally arousing situations rather than as a consequence of a deficit in their capacity to respond empathically to others' feelings. To the extent that individuals' cognitions influence their vicarious affective responses towards others, their misperception of the situation may preclude sympathetic responding without necessarily implying any lack of capacity for empathy. The degree of accuracy in interpreting another's affective state, across the two CD subgroups and typically-developing controls, will form the basis of investigation in the next study reported here.

3.5.2.3 Caution in the interpretation of the physiological data

Particular caution is warranted in interpreting the present patterns of HR as conclusive evidence that a developmental impairment or deficit in the capacity for vicarious affective arousal contributes to increased levels of antisocial conduct. Firstly, autonomic hypoarousal is by no means limited to CD/CU children or to adult psychopathic criminals. Significant variations are seen in normative adult samples and this may apply to children as well. Secondly, the present study provides only cross-sectional data. Issues of causality are not elucidated. Although it would not be

consistent with theoretical expectations, it cannot be ruled out that even the reverse causal sequence is possible. For instance, it may be that autonomic hypoarousal and/or reduced vicarious arousal may develop as a function of early problematic behaviour rather than being a cause of this behaviour. Alternatively, it may be that both a deficiency in the capacity to get vicariously aroused and the behaviours characterising CD/CU evolve from similar or different sources but they develop contemporaneously. For example, it is possible that autonomic hypoarousal and/or reduced vicarious arousal develop partially as a function of early adverse environmental conditions. It has been suggested that there are functional dimensions of the ANS (Autonomic Nervous System) that change or develop, in part, as a function of early environmental experiences (Raine, 1996).

Factors implicated in CD subgroups differential capacity to get vicariously aroused need to be studied in much younger samples, and require explicit longitudinal validation. Prospective longitudinal studies have found autonomic hypoarousal (as reflected in low baseline HR and SC) at age 15 (Raine et al., 1990a) and at age 11 (West & Farington, 1977) to be predictive of adult criminal behaviour, and at age 3 to be predictive of antisocial conduct at age 11 (Raine et al., 1997). However, this relationship has not been established from the very early stages of life. A further longitudinal study (Van Hulle, Corley, Zahn-Waxler, Kagan & Hewitt, 2000) failed to extend the link to the very early stages of life, with low baseline HR at the early age of 14-36 months not being predictive of externalising psychopathologies at the age of 7. Therefore, the evidence linking autonomic hypoarousal and antisocial conduct, and the mechanisms involved, is still inconclusive.

The evidence linking reduced vicarious arousal to antisocial conduct is even less conclusive. To our knowledge, there have been no longitudinal studies following HR patterns and other indices of vicarious arousal. Future investigations could employ both longitudinal and cross-sectional methods to establish whether there is a bidirectional relation between deficits in vicarious arousal and psychopathological antisocial conduct.

3.5.3. Affective empathy as indicated in indirect self-reports

In contrast to the direct measures of vicarious affective arousal (i.e. increase in HR), the self-reports of emotional experience in response to an evocative episode and the *Bryant Empathy Index*, have shown a superiority of typically-developing controls relative to both CD subgroups. These self-report data, if considered independently of the direct indices of vicarious arousal, seem to provide support for conceptual expectations (i.e. which would predict lower capacity for affective empathy across CD children relative to controls). The self-report findings are consistent with the patterns obtained in a study by Cohen & Strayer (1996) for clinically diagnosed institutionalised CD adolescents (aged 14-18 years). In line with present findings, using similar procedures, Cohen and Strayer reported: a) lower affect match (in response to videotaped characters' affective state) and; b) lower scores on the *Bryant Empathy Index* in CD adolescents than in typically-developing controls. In contrast, in a younger sample, MacQuiddy *et al.,* 1987 reported no differences between parent-identified CD children aged 5-7 years and typically-developing controls on the *Bryant Empathy Index*. However, they utilised a small sample size which reduced the statistical power of the analyses.

Nonetheless, although present indirect self-report data (of both emotional experience in response to the evocative episode and the *Bryant Empathy Index*), provide support for conceptual expectations, the findings of the direct physiological measures of vicarious arousal call into question the reliability and validity of the data obtained by such indirect measures. If current preliminary data are replicated, and if the results across measures are considered together, a tentative conclusion emerges. Given that CD/cu children did not show deficits in this capacity for vicarious arousal (in the direct measures of arousal) in comparison with the controls, it seems that the verbal self-report measures may have underestimated the capacity to get vicariously aroused in a significant number of CD children, specifically in the subgroup of CD/cu children.

Why should the verbal reports have underestimated the capacity for vicarious arousal in the CD/cu children? There is a set of, perhaps, interacting factors that might have contributed. Firstly, it has been shown that self-report measures of affective empathy

for children appear confounded by experimental demand characteristics eliciting social-desirability response sets (see Eisenberg & Lennon, 1983). The difference obtained on these measures between the CD/cu and typically-developing children, therefore, might partly be an artefact of the control children's greater tendency to react in a socially desirable way. In the present study, social desirability measures were not collected but Cohen and Strayer (1996) reported a diminished tendency in the CD group to respond in a socially desirable way, and that social desirability across groups correlated significantly with the *Bryant Empathy Index*. Significant correlations between questionnaire measures of empathy and social desirability have also been observed in some other studies (see Eisenberg & Miller, 1987) but not all (e.g. Chovil, 1985; Bryant, 1982). Secondly, verbal measures of vicarious affective responses are known to be affected by verbal skills (Eisenberg & Fabes, 1990; Chisholm & Strayer, 1995). In the present study, the CD/cu children demonstrated diminished verbal skills in comparison with the controls, so it might be that the results are a function of a group difference in verbal skills. Thirdly, the ability to decipher and accurately communicate another's or one's own affective state is also implicated in the patterns of self-report data (Chisholm & Strayer, 1995; Eisenberg & Fabes 1990). It might be that CD/cu children have inferior introspective skills due to, e.g., socialisation practices. Fourthly, it could be that CD/cu children have a diminished tendency, in comparison to the 'typically-developing' controls, to reveal their inner feelings. Finally, it is important to note that direct physiological indices of vicarious arousal capture nothing more than arousal per se. No inferences should be made either for stereotypical/socially-expected cognitive interpretations of this arousal and/or conscious awareness of the arousal and its source. It may be argued that, to a significant extent, the difference obtained across the indirect self-reports and the direct physiological indices between controls and CD/cu children simply indicate: a) misattribution of CD/cu children's vicarious arousal (e.g. diminished tendency of the CD children to interpret their arousal as stemming from the affective state of another), and/or; b) dissociation between vicarious arousal and conscious awareness/socially expected cognitive interpretation of the vicarious affective arousal in CD/cu children.

Turning to the more general issue of the validity of the self-report measures as indices of vicarious affective responding per se in CD children, the preliminary findings of the present study, if replicated, extend the results of study 1 for typically-developing children (aged 8-10) to CD populations at least in the examined age range (7.6- 10.8 years). These findings suggest that indirect verbal self-reports of vicarious experience do not adequately tap the capacity of vicarious arousal in CD children, at least in the examined age range. Present findings further suggest that, if verbal self-report measures are used to compare typically-developing children to CD children (and this may also apply to other clinical populations) they might result in inadequate conclusions.

Of course, the *Bryant Empathy Index* has been designed to assess empathic/sympathetic disposition. From the present data it cannot be decided whether this measure captures sympathetic responding (i.e. concern for another's emotion), or whether it taps empathy conceptualised as a multidimensional construct. But this preliminary data does suggest that the measure does not adequately tap a substantial component of empathy, namely the capacity for vicarious affective arousal.

However, despite the weakness of the self-report measures to tap the capacity for vicarious arousal, the results of the present study provide indirect evidence that, in the current sample, they have been more predictive than the direct index of the behaviour of CD children. Both CD groups are involved in antisocial conduct and their tendency to score lower than the controls on both self-report measures seems to be predictive of their behaviour. While self-reports have been found to be less predictive than other measures (e.g. physiological, facial measures) of prosocial behaviour (see Eisenberg & Miller, 1987), present data suggest that they may be more predictive of serious and persistent patterns of antisocial behaviour. However, predictiveness of behaviour is not really the issue here. If the theoretical link between the capacity to get vicariously aroused and serious patterns of antisocial conduct is to be clarified, measures that capture this capacity per se need to be employed.

3.5.4. Limitations

Several methodological limitations of the current investigation may have had an impact on the patterns of results obtained. An important methodological limitation is that the assessment of vicarious affective arousal was situational. The capacity for vicarious responsiveness was assessed on a single occasion. It remains to be seen whether these results can be replicated across a number of situations and with the use of other stimuli. More importantly, it still remains to be explored whether the present work will demonstrate ecological validity. Studies using physiological measurements in naturalistic settings are difficult to implement, but still plausible as HR can be accurately and validly measured using noninvasive pulse meters (Treiber, Musante, Hartdagan, Davis, Levy & Strong, 1989). Nonetheless, the more sophisticated instruments used in laboratory settings have, for the moment, an edge over the instruments that can be used in naturalistic settings. For instance, laboratory settings provide the opportunity to synchronise the recording equipment and the stimulus presentation with great accuracy thereby obtaining more valid and reliable results. In ideal situations, both types of measurement contexts (laboratory and naturalistic settings) would be employed, allowing conclusions to be drawn with greater confidence, and generalised.

Apart from the problems related to the assessment of vicarious affective arousal, there are also some problems inherent in rating scales. These problems apply to the scales used in the current investigation to identify CD children (conduct difficulties Rutter subscale), to classify CD subgroups (CU subscale of the PSD) and to compare these subgroups on other difficulties (i.e. impulsivity and narcissism subscales of the PSD). Six of the problems inherent in the ratings scales require particular caution:

Firstly, informants' ratings represented mostly overtly-observed behaviour (or recorded in the children' s files). Informants may have not been aware of children's covert antisocial behaviour or, more importantly, of their feelings that might have been kept private. This is especially true in the disturbed population of CD children. This is particularly troublesome in the current study, in which both informants were drawn from the single setting of the child's school. Yet, it is typically recommended that multiple informants from different settings need to be employed for assessing

child psychopathology (Kamphaus & Frick, 1996). School situations provide fewer opportunities for being aware of children's inner feelings than of observing their overt behaviour. Therefore, this simple setting effect is likely to have been more pronounced in the CU subscale utilised for the classification of the CD children than for the conduct difficulties Rutter scale used for identification of the CD children. Antisocial behaviour is acted out and easily observable but feelings are not. Although the findings were in line with expectations, it is conceivable that some children might have been incorrectly classified.

A second problem inherent in rating scales is that some behaviours are context specific (Hogg, Rutter & Richman, 1997). Some, such as oppositional-defiant behaviour, reflect not only internal characteristics but also relational qualities. Others, such as hyperactivity, are affected by the degree of structure in the situations and by the tasks that the children are involved in.

Thirdly, the informants were required to judge the degree to which children manifested the sets of behaviour traits or difficulties relevant to the present study. In effect, informants' judgement would necessarily be based on a comparison of the children within one particular setting. Therefore, in the current samples, it is conceivable that children from the residential EBD institution might have had greater conduct problems than children in EBD day schools. However, they were rated only in comparison to other CD children within their institution. Therefore, from an objective standpoint, children may have received higher or lower ratings because of this simple setting context.

A fourth problem inherent in rating scales is that they may be affected by the informant's mental state (Hogg *et al.,* 1997). For instance, individuals who are temperamentally overanxious might be more sensitive to children's anxieties. However, although this bias might affect ratings, evidence does not suggest strong effects in most of the cases (Richters, 1992).

A fifth problem is that ratings are usually made on the basis of some general impression of the child (Aman, 1993). Consequently, this may have led to diminished accuracy in reports of specific symptomatology (i.e.

impulsivity/narcissism/CU traits/conduct difficulties) and encouraged a tendency to rate a particular child high or low on all the scales. Present data have shown that those children who were rated high on one scale were rated high on the others, and those who were rated low on one scale also tended to score low on the others. The data could be an accurate reflection of children's specific traits, but it may also partly be a function of a general impression formed about the child.

Apart from these problems which apply to both the conduct difficulties Rutter subscale and the PSD subscales, there is a further problem specific to the PSD. In contrast to the Rutter scales for which reliability has been well documented (see Elander & Rutter, 1996), the PSD is a new measure. Although preliminary reliability and validity data have been reported (e.g. Frick *et al.*, 1994b; Frick *et al.*, 2000a), PSD is a measure that has yet to be refined (Frick, personal communication October 2001).

A further assessment issue to be considered is the measure of language skills used in the present investigation. This measure of receptive vocabulary might not give a clear indication of a child's ability to express emotion. It might be that some children have specific difficulties with expressing emotional vocabulary without having a more general difficulty with verbal ability. A more specific measure of emotion vocabulary would, perhaps, give a clearer idea of whether diminished reporting of vicarious arousal was simply due to deficiencies in emotional literacy. Of course, such evidence might be circular as the expression of emotional vocabulary may be a function of the ability to experience emotion. In this case, if measures of both generic verbal skills and emotional expression were utilised, clearer conclusions might be drawn.

In addition to these measurement issues, a further methodological limitation which may have influenced the findings of the present investigation is the sample bias inherent in the subject selection procedures. As the total population of CD children was recruited from EBD schools, it might be that the sample is not representative of the general population of CD children.

Of further potential concern in the current investigation is the difference between the age range of the CD samples (3.2 years) and of comparison controls (2 years). The large age range of the CD samples is problematic in its own right because developmental changes occur in both cognitive and physiological variables. For instance baseline HR, although at a very slow degree, is known to become progressively reduced with age. Comparing the CD samples with the control group may have masked developmental differences (or lack of difference) in different stages of development across groups. It may be, for example, that the groups do not differ in capacity for affective empathy at the age of 7.5 but they do differ at the age of 10.

However, although the large age range in the CD samples might have masked developmental differences, within or between groups, it seems unlikely that the differences observed between the groups are an artefact of the age range. This assumption is based on the finding that, although not differing in age range, the two CD samples still differed in the capacity for vicarious affective arousal. Nevertheless, although the age range was not a factor in the difference between the two CD subgroups, it cannot be ruled out as a factor in the difference between CD/CU and comparison control samples.

A further limitation inherent in the present study relates to gender. Given that the CD samples were predominantly males while the control sample comprised 18 boys and 15 girls, it might be that the results obtained are confounded with gender. Although, in the first study reported here, and in the study by Zahn-Waxler et al., (1995), no significant gender effect was observed, either at baseline or during the evocative episodes, there have been other studies with particularly big samples that have documented a gender difference in the baseline HR but not during the evocative episode (e.g. Calkins & Dedmon, 2000). No studies, to our knowledge, have documented gender effects in the degree of HR change in response to emotionally evocative context. Thus, it might be assumed that the results regarding vicarious affective arousal are not an artefact of gender. This assumption is further supported by the difference in the degree of HR change between the two CD subgroups. As both subgroups consisted predominantly of males, the difference observed between

them is unlikely to be a function of gender. This indicates that the difference observed between CD/CU children and controls was unlikely to be associated significantly with gender either.

Finally, of further potential concern is that medication was not controlled. However, the drugs most commonly available to this age group in Britain do not decrease HR and therefore should not account for the smaller cardiovascular responses in the CD/CU children (McDougle, Stigler & Posey, 2003).

3.5.5. Conclusion

Despite these limitations, the present study supports the growing body of empirical literature suggesting that there are important subgroups of children with severe conduct problems who may have distinct causal mechanisms underlying their behaviour (Moffitt, 1993b). The results of the current investigation suggest that recognition of this heterogeneity may be especially important in research on potential deficits in affective dimensions of empathy in CD children. The problem of deficits in the capacity for affective empathy, a finding that many authors would consider robust, appears to be characteristic of only a specific subgroup of CD children. This finding, if replicated, has important clinical implications. To our knowledge, no studies have documented that the physiological underpinning of the capacity for vicarious affective arousal can be fostered by interventions programs. Therefore, these programs might not be effective for the CD/CU children. Other interventions more directly targeting factors that can be altered in this subgroup of CD children need to be developed and tested.

CD/cu children, on the other hand, did not present deficits in affective empathy. It is plausible that their antisocial conduct is to a significant extent linked to deficits in relatively more cognitive aspects of empathy (i.e. cognitive and affective perspective-taking). As discussed above, Hoffman's developmental model of empathy (see section 3.5.2.2) predicts that the ability to intentionally inhibit antisocial conduct depends upon having reached a certain level of cognitive development at which it is possible to accurately interpret another's affective state. The degree of accuracy in interpreting another's affective state, across the two CD

subgroups and typically-developing controls, will form the basis of investigation in study 3 reported here.

Chapter 4: Study 3

Cognitive and affective perspective-taking in conduct-disordered (CD) children

4.1. Overview

The focus of this thesis, thus far, has been the affective dimensions of empathy (operationalised as the vicarious affective arousal) in subgroups of CD children (i.e. CD/CU vs. CD/cu) in comparison to 'typically-developing' controls. The current chapter focuses on 'purely cognitive' (i.e. cognitive perspective-taking) and 'combined cognitive/affective' (i.e. affective perspective-taking) dimensions of empathy. Based on the findings and adopted classification system of study 2, the present chapter sets out to compare affective and cognitive perspective-taking across groups of CD/CU and CD/cu children and aged-matched, 'typically-developing' controls.

4.2. Introduction

Most theorists hold that empathy, albeit characterised by its affective components, involves cognition as well as affect. For instance, some suggest that the ability to differentiate among and identify others' affective states, and the ability to take their cognitive and affective perspective (i.e. perspective-taking) are prerequisites for empathising with someone (e.g. Batson, 1987; Feshbach, 1978).

Hoffman, in his influential developmental model of empathy (1975; 1977; 1987; see section 2.3), gives primacy to the affective dimensions of empathy postulating that the observation of distress in others triggers an innate 'empathic distress' response in the child, even before the child has the cognitive capacity to differentiate 'other' from 'self'. However, he also proposes that affective dimensions of empathy are experienced differently as the child progresses through changes in social-cognitive processing. More specifically, Hoffman argues that gradually, as a child ages, the range of cues and stimuli that can trigger vicarious distress increase through both classical and operant conditioning. Eventually, when a child develops the cognitive

ability to take another's perspective, vicarious distress evolves into sympathy which motivates intentional moral conduct. Hoffman's view that the capacity to take another's perspective predisposes intentional moral conduct dovetails nicely with Piaget's (1932) theoretical work. This work stresses the importance of perspective-taking capacity for enabling an individual's anticipation of others' behaviour and reactions, therefore leading to smoother interpersonal relationships.

If perspective-taking is important for engaging in intentional moral conduct (Hoffman, op cit), or for facilitating social functioning (Piaget, op cit), it is likely that deficits in the ability to understand another's cognitive and affective perspectives may be implicated in persistent antisocial conduct. For instance, Gough (1948, as cited in Miller & Eisenberg, 1988) and Hare (1970) have long ago suggested that a history of antisocial behaviour results from a deficiency in perspective-taking. Empirical studies, however, examining cognitive or/and affective perspective-taking produced equivocal results depending on the population tested, the sample size (with its effect in the statistical power of the analyses), and the perspective-taking measures employed.

4.2.1. Empirical research on cognitive perspective-taking

Across the early studies, one of the most widely used methods of cognitive perspective-taking assessment has been the Flavell, Botkin, Fry Wright and Jarvis (1968) role-taking task. This measure consists of cartoon story sequences which the participant must describe, firstly from the central character's viewpoint, and then as the bystander in the story might see it. The bystander does not witness prior events which the central character has experienced, but only witnesses the resultant behaviour. In this measure, high scores are given to participants who successfully withhold this privileged information when asked for their description of the bystander's perspective.

Utilising a slightly modified version of this measure, Chandler (1973) found delinquent boys (aged 11-13 years) to have marked deficits in the ability to successfully adopt the cognitive perspectives of others. These discrepancies persisted despite controls for differences in socioeconomic and intellectual levels. Employing

similar procedures, Little (1978) found cognitive perspective-taking deficits in 73 % of the 37 female delinquent adolescent offenders she had tested.

Similarly, Lee and Prentice (1988), utilising a slightly modified version of the Flavell *et al.* (1968) role-taking task with adolescent delinquent males (aged 16), found cognitive perspective-taking to be lower in these adolescent delinquents in comparison with a control sample matched in terms of age and verbal ability. Making one of the first attempts to deal with the heterogeneity within children with conduct problems, Lee and Prentice (op cit) also subdivided the delinquent group into psychopathic, neurotic and subcultural (based on the degree of socialisation defined by Quay & Parsons, 1971). They failed to observe any significant difference in the cognitive perspective-taking abilities of these subgroups. Each subgroup however, was formed by only 12 participants and therefore the power of statistical analyses was relatively low.

Using the Chandler (1973) version of the Flavell *et al.* role-taking task, Kaplan and Arbuthnot (1985) attempted to address possible gender effects by comparing four groups: 10 male and 10 female delinquent adolescents (aged 14-15.8 years), and 10 male and 10 female non-delinquent adolescents (aged 13.4-14.4 years). No differences were reported across the four groups. The particularly small size of each subgroup in this study, however, makes it difficult to conclude that the groups did not differ.

The findings reviewed so far, with the exception of those whose sample size was possibly too small to detect any existing difference, seem to suggest that cognitive perspective-taking inferiorities do characterise a significant number of children with conduct problems who were identified as delinquents. Nonetheless, these findings need to be treated with caution. Although most delinquents would meet the criteria for CD, delinquents are the subgroup of children and adolescents with persistent conduct problems who are identified by the legal system. It seems plausible therefore, that they present some specific characteristics which may render them more likely to be detected by the legal system. For example they may have a greater vulnerability, or a greater perspective-taking deficit relative to other children with persistent conduct problems. Therefore, although most delinquents could be

classified as CD it might prove problematic to generalise findings for delinquents across the CD population.

Empirical data on cognitive perspective-taking specifically, in CD children are scarce. In a study with institutionalised CD children (recruited in schools for children with Emotional and Behavioural Difficulties - EBD) utilising the Flavell *et al.* role-taking task, Chandler, Greenspan, and Barenboim (1974) found that CD children manifested inferior cognitive perspective-taking skills compared to control children.

Institutionalised CD boys (at the age of 10) were reported to be inferior to typically-developing boys in cognitive perspective-taking in a study by Waterman, Sobesky, Silvern, Aoki, and McCauley (1981). This study utilised the Flavell *et al.* (1968) perspective-taking logic task whereby children are required to develop and provide rationales for a guessing game strategy. Rationales given by a child are scored in terms of the extent to which the child recognises another's ability to take the child's own strategy into account. This task, apart from being cumbersome, seems to mostly tap problem-solving skills rather than cognitive perspective-taking.

The methodologies used to tap cognitive perspective-taking abilities in these reviewed studies may sometimes have lead to misleading conclusions. They involve cumbersome tasks and may therefore underestimate CD children's perspective-taking ability. Over the last two decades, a broadly used paradigm for the assessment of mainly cognitive and, to a lesser degree, affective perspective-taking has been the 'false-belief ' task. False-belief tasks, often referred to as *'theory of mind'* tasks, were initially intended to tap the ability to attribute mental states in children up to the age of 5 (first-order false-beliefs tasks) (e.g. Baron-Cohen, Leslie & Frith, 1985; Perner, Leekam & Wimmer, 1987; Leslie & Frith 1988; Perner, Frith, Leslie, & Leekam, 1989). Subsequently, further tasks have been developed, with increased cognitive requirements (usually designated as 'second-order' and 'advanced' tasks), intending to tap cognitive and affective perspective-taking in children throughout childhood and even into adolescence (e.g. Happé, 1994; Sutton, Smith, & Swettenham, 1999a; Perner & Wimmer, 1985; Baron-Cohen, Jolliffe, Mortimore & Robertson, 1997; Warden, Christie, Cheyne, Fitzpatrick & Reid, in preparation).

The common feature of these perspective-taking tasks is the formation of a false-belief about a social situation. One character is privy to information of which the second character is not aware (and often depending on the complexity of the task, a second false-belief is formed by the first character). The task assesses the extent to which a child is aware of the differing thoughts and resulting emotions that the story characters have of the same situation, based on the differing perspectives these characters hold.

Employing such a false-belief task, Happé and Frith (1996) reported no evidence of deficits in inferring others' thoughts in CD children (6-12 years) recruited from a special day school for children with EBD, in comparison with 'typically-developing' controls (7-9 years). Happé and Frith, however, utilised a first-order task. The first - order false-belief tasks are really only appropriate for individuals of mental age below 6 years. If used with individuals of mental age above 6 years, these tasks are subject to ceiling effects (Baron-Cohen et al., 1997). Therefore, it seems plausible that the lack of perspective-taking deficits in the CD sample in Happé and Frith study is due to the relative simplicity of the measures.

In conclusion, it seems that attempts to empirically link deficits in cognitive perspective-taking to CD have not always been consistent with conceptual expectations. It is possible that perspective-taking deficits in CD children are more affective than cognitive specific. For instance, Ianotti (1985) and Denham (1986) reported higher positive correlations between prosocial behaviour and affective rather than cognitive affective perspective-taking. While Carlo, Knight, Eisenberg & Rothenberg (1991) reported that children's prosocial behaviour was related to situation specific affective-perspective taking, but not to cognitive perspective-taking measures. Similarly, it may be that affective rather than cognitive perspective-taking deficits characterise CD children.

4.2.2. Research on both cognitive and affective perspective-taking in tasks requiring relatively high cognitive skills

In one of the first studies to extend the focus of research to include not only cognitive but also affective perspective-taking, Rotenberg (1974) reported that delinquents

scored significantly lower than non-delinquent adolescents on measures of affective perspective-taking, but not on cognitive perspective-taking. This finding would seem to indicate a probable disjunction between cognitive and affective perspective-taking in delinquents, if it did not suffer from two important limitations. Firstly, the affective perspective-taking measure assessed affective perspective-taking in conjunction with affective sharing (i.e. affective empathy) of other's emotions in a particular situation. Therefore, the affective perspective-taking inferiorities attributed to the delinquent sample were probably the result of deficits in emotion sharing rather than emotion understanding. Secondly, the preliminary findings for cognitive perspective-taking should be treated with caution as no reliability or validity evidence is offered for the utilised measure. Despite these problems, the early work by Rotenberg sets the scene for other investigators to employ more controlled procedures, and to test for a possible disjunction between cognitive and affective perceptive-taking.

In a correlational study with a normative sample (11-13 years), Sutton, Reeves and Keogh (2000) used an advanced theory of mind task – The Eyes Task (Baron-Cohen *et al.*, 1997). They found no evidence of links between the ability to infer others' thoughts/emotions and conduct problems behaviour (as measured by a 21-item self-report behaviour checklist, comprising all but one of the diagnostic criteria for CD and ODD according to DSM-III-R, APA, 1987). As a guide to the level of conduct problems in the sample, it was reported that 10% satisfied the CD criteria. However, as self-report assessments were used, and persistence of conduct problems behaviour was not accounted for, these findings might not generalise to CD populations. Also, no separate analyses were conducted for cognitive and affective perspective-taking. No inferences can therefore be made as to whether cognitive or affective perspective-taking might differ in their relation to antisocial behaviour, at least in normative samples.

In a large-scale study (N=321), with a normative sample, Warden, Christie, Cheyne, Fitzpatrick & Reid (in preparation) utilised a single task for the assessment of both cognitive and affective perspective-taking. This task allowed a more direct testing of the possible disjunction between understanding others' thoughts and others' emotions. Importantly, they conducted a separate analysis for cognitive and affective

perspective-taking. Warden *et al.* examined 4 groups of children (aged 9-10 years), within a single community sample, who were categorised by peer nominations as prosocial, bullies, victims of bullying and neutral (children rarely nominated in any of the other categories). Bullies were found to be significantly inferior, in both cognitive and affective perspective-taking, relative to their prosocial counterparts but not to any other group. Although these results may not generalise to CD populations, the developed methodologies allowed the testing of a possible disjunction between affective and cognitive perspective-taking. But, nonetheless, with these methodologies which require relatively advanced cognitive abilities, deficits in affective perspective-taking accompanied with deficits in cognitive perspective-taking may indicate a cognitive specific effect.

4.2.3. Empirical data from studies assessing affective perspective-taking in tasks requiring limited cognitive skills

In studies that targeted affective perspective-taking, using tasks with limited cognitive requirements, MacQuiddy *et al.*, (1987) reported no differences in measures of affective perspective-taking (identifying a story character's emotions depicted in a series of photographs) between parent-identified CD and non-problem behaviour boys (aged 5-7 years). The results of this particular study, however, would need to be interpreted with caution as the particularly small sample size (11 CD and 12 non-problem behaviour boys) reduced the statistical power of the analyses.

In contrast, Waterman *et al.*, (1981) found that institutionalised CD boys (aged 10) were significantly inferior to 'normal' boys in affective perspective-taking measures (identifying simple, complex or mixed emotions of characters in videotaped social interactions). In line with Waterman *et al.*, (1981), Minde (1991) found evidence of deficits in affective perspective-taking (ability to identify feelings of happiness, fear, anger and sadness in others, using a picture completion format) in preschoolers (aged 4-4.5) with conduct problems, in comparison to two non-conduct problems groups, one drawn from the same nursery schools, and a second which had experienced significant violence without showing conduct problems. The conduct problems group was drawn from preschoolers who had been repeatedly referred to a Child

Psychiatric clinic due to their conduct problems. Children were only included in the final sample if they demonstrated high levels of conduct problems. The 'twin' criteria of consecutive referrals and high levels of conduct problems suggest that Minde's conduct problems group met the criteria for CD. In agreement with Minde's results, Cohen and Strayer (1996), found that clinically diagnosed CD adolescents (aged 14-17 years) had fewer correct identifications of characters' emotions as portrayed in vignettes.

To conclude, the evidence from studies targeting affective perspective-taking in CD children, in tasks requiring low cognitive requirements, seem to give some support to the conjecture that deficits in affective perspective-taking characterises CD children. This evidence, however, does not seem to be conclusive given the small number of empirical investigations.

4.2.4. Empirical data which contradict conceptual expectations

The reviewed studies thus far have either supported the hypothesised negative association between affective and/or cognitive perspective-taking and antisocial conduct, or corroborated the null hypothesis. There is, however, a number of studies with both normative and CD populations that contradicts theoretical speculations.

For instance, in a relatively recent study of bullying in a normative sample of children aged 7 to 10, Sutton, Smith and Swettenham (1999b) used a false-belief task to assess cognitive and affective perspective-taking in relation to role in bullying. They found that, on combined social cognition scores (cognitive and affective perspective-taking), 'ringleader' bullies outperformed not only the 'followers' (those who helped or supported the bully) and the victims, but also the prosocial children. When affective and cognitive perspective-taking were considered independently, however, the 'ringleader' bullies outperformed the followers in affective perspective-taking but no group differences were observed in cognitive perspective-taking. These findings may not necessarily apply in CD populations. Nevertheless, they seem to suggest that there might be a distinct operation of cognitive and affective perspective-taking across diverse subgroups of children who show conduct problems.

146

In a further normative study challenging conceptual expectations, Silvern (1976, as cited in Waterman *et al.*, 1981) reported that, among 10-11 year-old boys, cognitive perspective-taking superiority was associated with relatively more severe antisocial behaviour. In contrast, Waterman *et al.*, (1981) reported no significant correlation between antisocial behaviour and cognitive and affective perspective-taking across the normative sample. Importantly, Waterman and colleagues reported that in their sample of institutionalised CD boys, affective, but not cognitive perspective-taking superiorities, were associated with higher levels of antisocial behaviour (Waterman *et al.*, 1981). Finally, in a study by Happé and Frith (1996) CD children (recruited from a school with children with EBD) demonstrated their mentalising abilities in domains of antisocial behaviour (lying, cheating, teasing, bullying) that presuppose well functioning cognitive perspective-taking abilities.

4.2.5. Factors implicated in the inconsistencies across studies and rationale for study 3

To summarise thus far, in our view the inconsistent findings across investigations seem to be the outcome of a substantial heterogeneity within children exhibiting conduct problems, possibly coupled with distinct operation of cognitive and affective perspective-taking abilities. These two factors have not been sufficiently taken into consideration by investigators and it may be that diverse populations with conduct problems show cognitive or affective specific deficits. Or, even others may show superiorities on one aspect of perspective-taking and inferiorities on the other.

Study 3 aims to investigate a possible heterogeneity of CD children and a probable distinct operation of cognitive and affective perspective-taking across CD subgroups. This investigation will be based on the findings and adopted classification system of study 2 (i.e. CD children high on callous unemotional traits (CD/CU) vs. CD children low on CU traits (CD/cu) to form the following rationale: Deficits in affective empathy have been implicated in deficits in affective but not cognitive perspective-taking (Hoffman, 1984). Study 2 identified a subgroup of CD children (i.e. CD/CU) that showed a deficit in the capacity for affective empathy (as indicated in the direct index of vicarious arousal – i.e. increase in HR), and a subgroup that did

not show such deficits (i.e. CD/cu). Further assessment of these subgroups might cast some light on the nature of perspective-taking deficits across CD subgroups. This approach will also allow an examination of possible dissociation between affective and cognitive dimensions of empathy across subgroups of CD children.

Put succinctly, study 2 has shown that deficits in affective empathy apply only in the CD/CU children. Perhaps the patterns of behaviour in this group have a unique affect-related aetiology. Affect-related deficits (e.g. deficits in the processing of emotional stimuli; low fearful inhibition) in CD/CU children have been demonstrated in other research (Frick *et al.*, 1994b; Frick *et al.*, 1999; O' Brien & Frick, 1996). Deficits in the purely cognitive aspects of empathy (i.e. cognitive perspective-taking) may not apply to this group. This assumption is based on empirical data supporting the claim that, in contrast to CD/cu children, CD/CU children are less likely to show intellectual deficits (Christian *et al.*, 1997; Loney *et al.*, 1998).

CD/cu children, on the other hand, did not show deficits in affective empathy (study 2). This finding may be suggestive of no specific affective deficit. In other empirical investigations, CD/cu children have been found to be more likely than CD/CU children to show verbal intelligence deficits (Critstina, Frick, Hill, Tyler & Fraser, 1997; Loney *et al.*, 1998). Perspective-taking deficits in this group may therefore be cognitive specific. They may present deficits in affective and cognitive perspective-taking when cognitive requirements are high. However, when cognitive requirements are low they may not show affective perspective-taking deficits.

Consequently, the present study was set out to compare patterns of affective and cognitive perspective-taking in three groups of children (aged 7.6-10.8 years). The groups were comparable to those who participated in study 2 viz.: i) CD/CU; ii) CD/cu, and; iii) age-matched 'typically-developing' control group.

Two tasks which varied in their cognitive complexity were used:

1. High cognitive skills task: A second order false-belief stories task was designed to assess both cognitive and affective perspective-taking in situations that cognitive requirements are relatively high. The cognitive

perspective-taking questions were selected to tap the character's thoughts and the affective perspective-taking questions to tap the emotions generated by these thoughts. his methodology would allow to test directly whether any specific group presents dissociation between inferring other's thought, and inferring the emotions generated by this thought.

2. Low cognitive skills task: A simple story task was designed to assess affective perspective-taking across a variety of emotions (i.e. sadness, happiness, anger, embarrassment, fear, sympathy, guilt, shame) in situations requiring limited cognitive requirements. This task was intended to provide evidence in terms of whether a deficit in any particular group is more cognitive, affective, or even emotion specific. If there are no affective perspective-taking deficits in this low cognitive skills task and both affective and cognitive perspective-taking deficits in the high cognitive skills task, then one may argue that such deficits are cognitive specific. Including a range of different emotions (sadness, happiness, fear, anger, embarrassment, guilt, sympathy, and shame) in the low cognitive skills task would allow exploratory testing of whether a particular group presented any deficit or distortion specific to any particular emotion.

Based on the line of reasoning described above, as summarised in table 4.1. below it was predicted that:

i. CD/cu children will present deficits in both cognitive and affective perspective-taking in the high cognitive skills task, relative to a group of 'typically-developing' controls. However, they may not present affective perspective-taking deficits in the low cognitive skills task.

ii. CD/CU children will present deficits in affective perspective-taking relative to controls in both high and low cognitive skills tasks but not in cognitive perspective-taking.

Table 4.1. Summary of the hypotheses

	Affective deficit (low cognitive skills task)	Affective deficit (high cognitive skills task)	Cognitive deficit (high cognitive skills task)
CD/CU	Yes	Yes	No
CD/cu	No	Yes	Yes

Finally, given that CD children present a diverse spectrum of emotional difficulties, the present investigation further employs limited qualitative analysis. Any meaningful pattern that might emerge from this analysis relevant to the current investigation with sufficient data, could be subjected to quantitative analysis.

4.3. Method

4.3.1. Participants

The study sample (N=111) comprised three groups of children: i) CD/CU (n=30, age range 7.6-10.8); ii) CD/cu (n=29, age range 7.6-10.8), and; iii) age-matched 'typically-developing' controls (n=52, age range 8-10). 35 of the CD children participated in study 2. All participants were White, English speakers and were recruited from state schools in Glasgow and surrounding areas.

The CD sample was recruited from four special schools for children with Emotional and Behavioural Difficulties (EBD). Procedures for selection of the target sample and the CD group formation were identical to that of study 2 described in section 3.3.1. Most CD children of the current samples tended to come from a lower socioeconomic background. In the CD samples, parental consent was not obtained in five cases. Two of these children were under the care of social services and therefore consent was not sought. In the other three cases consent was refused. Therefore none of these five children was included in the sample.

The sample of 52 'typically-developing' controls was drawn from a school in a deprived area of Glasgow. Again, most children tended to come from a low socioeconomic background. This group of controls was specifically selected to have as similar as possible social characteristics to the CD children. Parental consent was not refused for any of the children who were selected for participation in the study.

The characteristics of the 111 children ultimately retained in the study are described in Table 4.2. For evaluation of the equivalence of the three groups refer to the results section.

Table 4.2. Description of the Sample Characteristics

	CD/CU (n= 30)	CD/cu (n=29)	Controls (n=52)
Mean Age (Range)	9.38 (7.6-10.8)	9.32 (7.6-10.8)	9.05 (8-10)
Number of girls	1	3	18
Number of Participants from			
EBD day schools	11	20	0
EBD residential school	19	9	0
Mainstream	0	0	52
Median Score on CU traits (IQR)	10 (2)	6 (1)	NA
Median Score on degree of conduct problems (IQR)	17 (3)	9 (7.25)	NA
Number of participants with			
Asperger's syndrome	3	1	0*
ADHD diagnosis	8	6	0*
ODD diagnosis	6	4	0*

CD/CU= Meeting the diagnostic criteria for CD (determined by the Revised Rutter Teacher conduct difficulties subscale (Hogg, Rutter, & Richman, 1997) elevated (upper quartile) on Unemotional traits; CD/cu = meeting the criteria for CD without elevated (50th percentile or lower) Unemotional traits; Unemotional Traits, were determined by the Callous Unemotional subscale of Psychopathy Screening Device (PSD; Frick & Hare in press); EBD=Emotional and Behavioural Difficulties; ADHD= Attention Deficit and Hyperactive Disorder; ODD= Oppositional Defiant Disorder; ADHD and ODD diagnosis was determined by diagnostic information contained in their files; CU= Callous Unemotional; NA=Not Applicable, IQR = Interquartile Range

*On the basis of the information contained in the children's school-files.

4.3.2. Measures

4.3.2.1. To identify Conduct-disordered (CD) samples and to compare CD subgroups

Conduct difficulties subscale of the Revised Rutter Teacher Scales for school-age children (Hogg *et al.*, 1997)

Described in section 3.3.2.1. In the present sample the correlation between the two informants reports was 0.68.

Psychopathy Screening Device (PSD; Frick & Hare in press)

Described in section 3.3.2.1. In the current sample, the correlations of the ratings of the two informants were 0.68 for total PSD score, 0.58 for the CU scale, 0.60 for the

narcissism scale and 0.64 for the impulsivity scale suggesting reasonable consistency.

4.3.2.2. To compare the two CD subgroups with 'typically-developing' controls

Affective and cognitive perspective-taking

For the assessment of affective and cognitive perspective-taking two different tasks varying in their cognitive complexity were used, a simple-story task and a false-belief task. The simple-story task (i.e. low cognitive skills task) focused solely on the identification of a range of 8 emotions (sadness, happiness, fear, anger, embarrassment, guild, sympathy, and shame) in a series of very simple stories in which cognitive requirements were limited (i.e. no false-belief). The false-belief task (i.e. high cognitive skills task) was designed to assess both affective and cognitive perspective taking, using stories in which more advanced cognitive skills were required. Each of the story protagonists had his/her own perspective (and subsequent emotion) of the situation, which was formed because of a false belief.

i. Affective perspective-taking: Low cognitive skills task

The task consisted of a set of very brief vignettes, in which some kind of emotional interaction between children (or children and adults) took place. The participants were required to identify and explain what they thought the story characters were feeling (*'How do you think X feels/felt when that happened?'* *'Why?'*).

The selection of the simple stories was conducted in two stages. In the first stage, with the assistance of three researchers in the area of developmental psychology, a set of 50 stories was collated. Across these stories the eight tested emotions (sadness, happiness, anger, fear, embarrassment, sympathy, guilt and shame) were roughly equally represented. These stories derived from two sources: 35 stories were based on Warden and Christie (1997), each of which incorporated one to three questions about the story characters' emotions.

*e.g. **Ben** is in hospital. He is seriously ill. **David** goes to visit him in hospital*

*Q1: How did **David** feel when he learned that Ben is ill?* – represented emotion: sympathy

*Q2: How did **Ben** feel when David visited him?* – represented emotion: happiness

15 stories derived from Blair, (1997), each employing one emotion question.

*e.g. **Tim** throws a book at his friend. His friend does not catch it and it smashes into another child's face.*

*Q: How does **Tim** feel?* – represented emotion: guilt

In the second stage, the stories were piloted on a group of 30 students (aged 18-32) and 10 randomly selected children (aged 8-10) to establish a criterion emotion (the most likely felt emotion) in response to each question. The three questions for each of the 8 emotions, which elicited the highest agreement in terms of proposed emotion were retained. If any story that had more than one question and any of these questions failed to be in those that elicited the highest agreement, the story was not retained in the task. Agreement was 85% or higher for any question retained.

The resulting 16 (seven of which incorporated two/three questions and nine a single question) – were subsequently tested on a random sample of 20 'typically-developing' children (aged 8-10). The majority of these children (75 % or more) answered each individual question according to the criterion emotion established during the construction phase of the instrument.

The stories adapted from Warden and Christie (1997) were accompanied by a cartoon strip illustrating the story. The stories adapted from Blair (1997) were not accompanied by a cartoon strip. Paired t-tests, between the performance (of the children who participated in the pilot) on the stimuli accompanied by a cartoon strip and those that were not, ensured that the presence or absence of a cartoon strip was not a factor on children's performance.

The set of the experimental stories can be found in Appendix 7.

ii. Affective and cognitive perspective taking: high cognitive skills task

The two false-belief stories were adapted from Warden *et al.* (in preparation). The stories were developed around social situations with which the children would be

familiar but had a degree of situational complexity. The common feature in these 'social stories', that allowed perspective-taking ability to be assessed, was the differing perspectives and false beliefs that the main characters had about the situation and each other.

> Birthday Present: **Louise** has asked her sister Mary to give her a CD of her favourite group Boyzone, for her birthday. The day before her birthday, Louise accidentally knocks Mary's bag on the kitchen floor. Some red wrapping paper and a CD fall out. The CD is All Saints, a group Louise hates. Louise puts them back in Mary's bag and goes to her room. Then Mary comes into the kitchen with a new CD of Boyzone, and wraps it in the red wrapping paper. Next day, Mary gives Louise her birthday present, wrapped in red paper. Before she opens it Louise says, 'I really like All Saints now'. Then she unwraps the paper, and finds a CD of Boyzone inside.

> Theft: A girl called **Helen** has just bought a bag of apples. On the way home she goes into a video shop and steals a video. She hides it under the apples in her bag and runs away. As she runs out of the shop, one of the apples falls out of her bag. Helen doesn't see it but the policeman sees the apple falling out of her bag. The policeman wants to tell about the apple, so he picks it up and shouts, 'Hey, you stop!' Helen turns around and sees the policeman. She goes over to the policeman and gives him the video telling him that she will not steal anything again.

Each story was accompanied by a three-picture cartoon strip to illustrate the critical features of the story (see Appendix 8) and three sets of questions:

i) Comprehension questions: Two comprehension questions were included to ensure that children tapped the factual content of each story (e.g. Birthday – *What did Louise want for her birthday? What did Louise find in Mary's bag?*

ii) Cognitive perspective-taking: For each story, two questions tapped children's understanding of what the characters were thinking. In order to give an appropriate response a child must understand that the two characters do not share the same perspective (e.g. Theft – *Why did Helen think the policeman was shouting at her? What did the policeman think was in the bag?* Birthday Present – *Why did Louise say to Mary 'I really like All Saints now'?*

iii) Affective perspective-taking: For each story, three questions tapped children's understanding of what the character was feeling. Again it was necessary for a child to understand the false-belief in the story to score well. Children were asked to assign emotional descriptors to

indicate how the character was feeling and to justify why they thought the character was feeling this way (e.g. Theft – *How did the policeman feel when Helen gave him the video? Why?* Birthday Present – *How did Louise feel when she found the All Saints CD in Mary's bag? – Why? How did Mary feel when Louise said she likes All Saints? – Why? How did Louise feel when she unwrapped her present and saw what was inside?*

Word Definitions Test of the British Ability Scales II

The *Word Definitions Test of the British Ability Scales II* (see Appendix 5) was included as a control measure to examine whether any differences in perspective-taking could partly be explained by differences in verbal ability.

4.3.3. Procedure

Piloting the perspective-taking tasks

The perspective-taking tasks, in their final form, were piloted using a random sample of five children (aged 8-10) from a mainstream school and three (aged 8-10) from a school for children with Emotional and Behavioural Difficulties (EBD). The children who were drawn from the mainstream school required 20 minutes or less for the completion of both sets of stories (simple and false-belief). Therefore, it was assumed to be non-problematic to administer both sets of stories in the same session to the control group. In contrast, one of the children from the EBD school required repetition, resulting in a session of 30 minutes duration. Therefore, it was considered appropriate to administer the two tasks in two different sessions for CD children. None of the children tested had any problems in comprehending the language of the instructions or stories.

Familiarisation with Conduct-Disordered (CD) children

Described in section 3.3.4.

Identification of children meeting the criteria for Conduct Disorder (CD) and group formation

Described in section 3.3.4.

Administration of the PSD subscales to the informants

Described in section 3.3.4.

Assessment of cognitive and affective perspective-taking in the CD and comparison control groups

All participating children were interviewed individually in a quiet room in their school. The procedure was varied slightly across CD and control groups. In the CD groups, the assessment of cognitive and affective perspective-taking was conducted in two sessions in a room adjacent to their classroom. Each session was conducted on a separate day, in most of the cases on two consecutive days. In one session, children were tested on the false-belief stories. The stories were introduced as follows: *'Here are some stories and some questions. I am going to read out the stories and I'd like you to listen carefully and help me with the questions at the end of each story.'* Each story was read out to the participant, and the relevant protagonist was concurrently pointed to. The cartoon strip remained in front of the child throughout the presentation of the questions to minimise memory requirements. The two control questions were presented first. On the occasions that the child failed to answer one of the control questions, the story was read out again. No child failed the control questions after the second time that the story was introduced. The questions assessing the affective and cognitive perspective-taking were then presented in the order that the events referred to had chronologically occurred.

In the other session, children were tested on the simple-stories task. Each story was read out one by one and, simultaneously, the accompanying cartoon picture was shown (for the stories that were accompanied by a cartoon). The children were asked to describe and explain what they thought the story character was feeling (*'How do you think X feels/felt when that happened?'- 'Why?'*). The order of the tasks and the presentation order of the stories within each task were counterbalanced across participants. The order of the questions pertaining to each story was kept constant. For both tasks, after each affective perspective-taking question, the children were reminded that they had to say how they believe the story protagonist feels and not how they would feel in the protagonist's place.

Children's verbal responses were recorded in full on scoring sheets for subsequent analysis. On the occasions when a child could not answer any question, the question would be re-read and the child would be prompted to make sure that s/he was certain that s/he was unable to answer. Any 'don't know' responses were noted on the response sheet. Positive comments were made throughout the testing sessions to encourage the child, but no feedback was given about the correctness of his/her responses. Administration was adjusted to suit the requirements of each participant with repetition when necessary, and, therefore, the duration of the sessions varied from approximately 8 to 20 minutes. One school staff member was available at all times in case any particular child would feel uncomfortable. Assistance was not needed in any of the sessions.

The procedure in the comparison group was slightly different. Following a brief period of familiarisation, the false-belief and the simple stories were administered on individual basis in a single session. The testing time varied from 10 to 25 minutes. In no case were the sessions allowed to exceed 25 minutes duration. On five occasions involving younger children, when repetition was required, the stories were not completed in 25 minutes. In these cases, the stories were given in two sessions, on separate days. The order of presentation of the stories was randomised across participants but the order of questions within each story was kept constant.

Assessment of Verbal Ability

Described in section 3.3.4.

4.3.4. Scoring Procedure

4.3.4.1. Scoring the Rutter scales and the PSD

Described in section 3.3.5.

4.3.4.2. Scoring cognitive and affective perspective-taking

Scoring the low cognitive skills task: Stages towards the development of the finalised coding scheme

A series of stages was followed for the development of the finalised coding scheme.

Stage 1: Pre-data collection 'stereotypical' coding scheme

The initial pre-investigation coding scheme required that, on the basis of the pre-established criteria (i.e. the emotion given by at least 85% of the group of adults and children tested during the construction phase of the instrument (see section 4.3.2.2), a group of judges would rate the full range of elicited responses in terms of how well they conveyed the relevant character's feelings in the context of the story. A score of 0-2 would be assigned based on the degree which each elicited emotion approximated the criterion emotion.

Stage 2: Post-data acquisition concerns over the validity of the 'stereotypical' coding scheme

When the data were collected and collapsed, it was observed by the investigator that the group of 'typically-developing' children gave more or less the expected emotion labels supported by conventional justifications. However, a significant number of CD children gave non-expected (i.e. not in accordance with the pre-established emotion criteria) emotional descriptors, but justified them in a non-expected (non conventional) way, which made the non-expected emotional descriptor more plausible.

> *e.g. **Ben** is in the Hospital. He is seriously ill.* **David** goes to visit him in hospital.
>
> *Q: How did David feel when he learned that his friend is ill?* (criterion emotion: sadness)
>
> *A: Mad. Angry. Very very very angry. He is going kill him. Honestly he is going to find who passed the sickness to his friend and kill him.*

This observation led to concerns about the validity of the task in tapping emotion understanding, at least in the tested population. Given that emotion, by its nature is a subjective experience, coding with pre-established stereotypical criteria may result in inaccurate conclusions. Therefore the pre-established criteria approach was judged as non-optimal, and an attempt to develop a more adequate (possibly less biased) coding scheme was initiated.

Stage 3: Attempts to develop a more adequate scheme. Emergence of need for qualitative analysis of children's responses

In the attempt to develop a more adequate coding scheme, the pre-established emotion criteria were not used. Instead, 12 judges (all of them with experience in research in developmental psychology) were instructed to rate on a score from 0 - 4 each of the children's full responses (i.e. emotion label + justification). The judges were instructed to give a score ranging from 0-2 for the emotion label in terms of the degree it indicated emotion understanding in the context of the story and 0-2 for the justifications, in terms of how well the given emotion was justified. They were also asked to indicate 'hard to rate' responses. An elaborate approach was followed to calculate reliabilities for each one of the 760 different responses. The results were interesting. The judges' uncertainties were revealed in their particularly low agreement in assigning ratings to certain types of answers and also by the number of answers they characterised as 'hard to rate'.

Across 760 different elicited responses:

- ➤ 30% raised low agreement among judges. 93% of these responses were given by CD children

- ➤ 23% were characterised by the judges as 'hard to rate'. 91% of these responses were given by the CD children.

Among these 'hard to rate' responses that yielded low agreement among judges, there were three types of answers that were particularly employed:

1. Responses giving an emotional descriptor that is not the one that the judges themselves would most immediately or obviously apply to the protagonists, but plausible justification. Most answers of this type came from CD children.

> e.g. The teacher hears somebody talking. He thinks it was Iain and he gives him a row. But it was actually **David** who was talking.
>
> Q: *How did **David** feel when Iain got the row?* (criterion emotion: guilty)
>
> A: *Happy. Because he managed to get away with it.*

2. Egocentrically-oriented responses. The majority of these responses derived from the CD children.

> **e.g. Ben** is in the Hospital. He is seriously ill.

*Q: How did **David** feel when he learned that his friend is ill?* (criterion emotion: sadness)

A: Sad. He does not want to catch the illness. He will then need to stay in bed.

3. Responses that were more likely to use information that was not included in the story to justify the emotional descriptor. Again, most responses of this type were given by the CD children.

> e.g. David and Jake are friends. **Jake**'s dog has died.
>
> *Q: How does **Jake** feel?* (criterion emotion sadness)
>
> *A: Angry, somebody must have poisoned him.*

Apart from these types of responses, there was a further pattern in the ratings assigned that raised concerns. These concerns again centred on whether CD children's ability to understand others' emotions might have been underestimated by the judges. There were some types of responses that yielded high agreement among judges, but this agreement seemed to have favoured 'typically-developing' children's responses relative to CD children's responses. More specifically:

1. Responses which gave moral emotional descriptors (i.e. sympathy, guilt, shame) had 100% agreement of judges. All judges assigned the highest score of 4. CD children were less likely to respond with a moral emotional descriptor even when they referred in their justification to others' welfare.

> e.g. **Tim** throws a book at his friend. His friend does not catch it and it smashes into another child's face.
>
> Q: *How does **Tim** feel?* (criterion emotion: guilt)
>
> A1: *Guilty. He should be careful.*
>
> (example of answers deriving mostly from control children. Received score of 4 from all judges)
>
> A2: *Angry with his self. Stupid. He could have killed the other boy.*
>
> (example of answers deriving from CD children. Judges had high variation in their ratings)

2. Responses that gave an emotion matching to the emotion that the judges themselves would apply to the story protagonist received the highest score of 4 from all judges. Most response of this kind derived from the control group.

> e.g. **Jake** is going home after school when he sees a bully pushing and teasing another boy. As he watched, he saw the bully push the other boy on the road and hit him. Jake then went home.
>
> *Q: How did the boy who was being bullied feel?* (criterion emotion: fear)
>
> *A: Scared. He was very weak. He could not run away to protect hisself.*

3. More intense, same valence emotions received lower scores. Almost all answers of this type came from CD children.

> E.g.1: David and Jake are friends. **Jake's** dog died.
>
> *Q: How does Jake feel?* (criterion emotion: sadness)
>
> A: *Devastated. His dog was his only company. He has nobody now to talk to.*
>
> E.g. 2: Stuart has an injured leg and walks with crutches. George laughs at him and shouts to his friends: "Look at the wimp that walks with a limp".
>
> *Q: How does Stuart feel?*
>
> *A: Heartbroken. Devastated. He cannot stand it. He wants to die.*

In summary, judges had: i) particularly low agreement for types of responses mostly deriving from CD children; ii) greater difficulty in rating types of responses mostly coming from CD children; iii) high agreement in assigning high ratings to answers mostly given by controls, and; iv) high agreement in assigning low ratings to responses deriving from CD children that might have underestimated CD children's ability to understand others' emotions. It seems that legitimate concerns are raised in terms of the reliability of a 'no-set criteria' coding scheme and the validity of the task.

Individual discussions with each of the judges, in the attempt to develop a more adequate coding scheme, revealed a common main observation: *'before scoring reliably I would want to have some kind of declaration of what the most likely feelings would be in each case. This would be used as a template, to judge the*

children's responses against. Otherwise, I find that you can justify a great deal of possible emotions, but they are not the ones that you would immediately and most obviously apply to actors'. The judges' most common question was *'if a justification is given that makes sense, does it make the emotion given correct even if it would be unlikely? - this also means that you might simply be measuring how close children's perceptions conform to a stereotypical view of the situation'.*

On the basis of the judges' comments, a number of different approaches were subsequently developed. None of these approaches raised high agreement among judges. Consequently, the exceptionally low reliabilities and the uncertainties of the judges necessitated the abandonment of 'without pre-established criteria' coding schemes.

Stage 4: Abandonment of 'without pre-established criteria' coding scheme: use of qualitative analysis

Based on the earlier difficulties, it was therefore decided to give to a new group of judges (see finalised coding scheme below) the 'pre-established criteria'. With the use of these criteria, the reliabilities were high (see below) and therefore this coding approach was followed. Apart from the quantitative analysis, a qualitative analysis of the children's responses was employed to supplement any valuable information not tapped directly by the quantitative analysis. Some patterns which emerged from the qualitative analysis (e.g. types of justification given to justify the emotional descriptor in the questions in which a moral emotion criterion -i.e. sympathy, guilt, shame was established) that were of particular interest and relevance to the current investigation could then be subjected to quantitative analysis.

Finalised coding scheme for the low cognitive skills task:

i. Emotional Descriptors

The full range of the emotional descriptors (usually an adjective) for each of the 24 questions were scored with the assistance of 12 judges (postgraduate students and researchers all in the area of developmental psychology). Based on the pre-established criteria, the judges ranked the full range of elicited emotional descriptors

on a scale of 0-2, according to how well they conveyed the relevant character's feelings in the context of the story. A score of 0 was assigned to irrelevant and non-answers whilst relevant but inadequate adjectives were assigned a score of 1. A score of 2 was assigned to the adjectives that 'exactly' or 'closely' matched the previously established criterion emotion. Interjudge agreement was 95% or better for each elicited emotional descriptor across the 24 questions.

ii. Justifications when the pre-established criteria suggested that the expected emotional descriptor would be moral (i.e. guilt, sympathy, shame):

Where the pre-established criteria suggested that the expected emotional descriptor would be on a moral dimension (guilt, sympathy, shame) then children's justifications for the emotional descriptors they used were scored categorically. The focus is only on these justifications because moral emotions and children's awareness of them seem most pertinent to the present study. The full range of children's elicited justifications for these responses was given to three researchers in developmental psychology. They were asked to identify meaningful categories by which the justifications could be classified. A group discussion followed their initial individual identification of possible categories. This resulted in identification of the following response categories: i) 'Self-oriented concerns': in which a protagonist's emotions were explained with reference to his/her own self-oriented concerns; ii) 'other's welfare': in which the protagonist's emotions were explained with reference to the welfare of the other character (victim), and finally; iii) 'satisfaction via another's suffering': in which the protagonist's emotions were explained with reference to satisfaction deriving from the other's character's suffering. Table 4.3 presents illustrated examples of each category of responses.

Table 4.3. Examples of types of justifications given to justify the elicited emotional descriptor in questions for which a moral emotion criterion was established

Type of justification	Story	Question/Answer
a) Another's welfare	Jake was going home after school when he saw a bully pushing and teasing another boy. As he watched, he saw the bully push the other boy down on the road and hit him. Jake then went home.	How did Jake feel when he went home? - *Ashamed of his self. He could have helped the other boy but he only cared about his self. He wants to kill his self he cannot stand it.*
	The teacher hears somebody talking. He thinks it was Iain and he gives him a row. But it was actually David who was talking.	How does David feel when the teacher is giving a row to Iain? - *Angry with his self because he got in trouble someone else when it was him who actually did it.*
b) Self-oriented concerns	Ben is in the hospital. He is seriously ill.	How did David feel when he learned that Ben is ill? A1: *David is sad because he has to go and sit with him. He cannot go out to play* A2: *David is sad because he does not want to catch the illness. He will then need to stay in bed*
c) Satisfaction from other's suffering	The teacher hears somebody talking. He thinks it was Iain and he gives him a row. But it was actually David who was talking. The teacher hears somebody talking. He thinks it was Iain and he gives him a row. But it was actually David who was talking.	How did David feel when the teacher was giving a row to Iain? - *Happy because he managed to get away with it.* How did David feel when the teacher was giving a row to Iain? - *Happy because he does not like Iain. It makes him feel happy when he manages to get somebody that he does not like in trouble.*
	Tim throws a book at his friend. His friend does not catch it and it smashes into another child's face.	How does **Tim** feel? - *Happy. Very very happy. He managed to hurt someone*

Following the identification of these categories, the full range of children's justifications for the questions for which moral emotion criteria were established (i.e. sympathy, guilt, shame) was given to 12 judges who were asked to indicate in which category each justification should be included. Any response that could not be

classified in any of the categories would be classified as 'other'. In all cases judges were naïve to the hypothesis being tested and blind to the group origin of the data.

The degree of interjudge agreement in the coding of children's responses was calculated for each participating group separately, to ensure that agreement was not significantly lower for any particular group. Interjudge agreement was 90% or better for each group.

Scoring the false-belief task

i) Scoring cognitive perspective-taking

For the scoring of cognitive perspective-taking, the scheme developed and validated by Warden *et al.* (in preparation), which had demonstrated an interjudge agreement of 90-100 %, was followed. Responses were assigned a score ranging from 0 to 2. A score of 2 was assigned if a child's response demonstrated an understanding of the false-belief and/or highlighted the differing perspectives of the characters in the story. (e.g. Birthday Present - Why did Louise say to Mary 'I really like All Saints now'- *Because she thought that that was the CD that Mary got for her, and she did not want to upset her.* Theft - Why did Helen think that the policeman was shouting at her? *Because she thought that the policeman had seen her steal the video.* If an answer was based on a purely descriptive understanding of the social story, giving no justification in terms of another person's perspective, a score of 1 was assigned. This score was also given to correct answers which were poor in reasoning and/or lacked any detail or elaboration. (e.g. Birthday Present - Why did Louise say to Mary 'I really like All Saints now' - *Because it's her present.* Theft - Why did Helen think that the policeman was shouting at her? - *Because of the video*). A score of 0 was assigned to incorrect and irrelevant answers and when a child was unable to give an answer.

Across the two stories used in the false-belief task, there was a total of six questions assessing cognitive perspective-taking yielding a maximum potential score of 12.

Scoring was conducted by the investigator and it was blind to the group origin of the data. As noted above for this particular coding scheme, a good degree of interjudge

agreement has been reported (see Warden *et al.*, in preparation). Given, however the element of subjectivity inherent in the judgment of the responses, covalidation of the scoring in the current study was necessary. Therefore, a random sample of 20% of coding sheets from each group was assigned to a second judge who was naïve to the hypothesis being tested and the group origin of the data. The degree of interjudge agreement was calculated (using the weighted Kappa procedures) for each group separately to ensure that agreement was not significantly lower for any particular group. Interjudge agreement was 90 % (Cohen's Kappa=0.80) or better across each of the three groups.

ii) Scoring affective perspective-taking

For the scoring of affective perspective-taking, a series of stages was followed. In the initial stage, a sample of children's responses (n=30, 10 for each group) was discussed by the three judges who had identified the categories for the categorical scoring of the justifications of moral emotion criteria questions. Again the judges were unaware of both the hypothesis being tested and the group origin of the data. Using as a template the coding scheme developed by Warden *et al.* (in preparation), in which emotional descriptors and justifications were coded separately (i.e. one score was assigned to the emotional descriptor and a second score was assigned to the justification), judges discussed and collapsed criteria combining judgement of emotional descriptor and justification into one single score.

Responses were assigned a score ranging from 0 to 2. Irrelevant and non-answers were assigned a score of 0. Responses that used moderately relevant emotional descriptors and justified their response with reference to the protagonist's immediate situation rather than making a reference to the false-belief (*e.g.* How did Louise feel when she unwrapped her present and saw what was inside?- *Louise feels good because she got what she wanted*) got a score of 1. A score of 2 was assigned to responses that involved a highly relevant emotional descriptor and were revealing of: i) awareness of the false-belief (*e.g.* Theft - How did the policeman feel when Helen gave him the video? Why? - *The policeman feels confused because he did not know that Helen stole the video*), or; ii) confounded expectation of the protagonist (*e.g.*

Birthday Present - How did Louise feel when she unwrapped her present and saw what was inside? - *Louise feels surprised because she thought she would get All Saints and not the CD she really wanted*).

For the two stories of the false-belief task there was a total of six questions assessing affective perspective-taking, yielding a maximum potential score of 12.

In order to validate these coding criteria, a further 12 judges, who were also naïve to the hypothesis being tested and the group origin of the data, scored a sample of children's responses (n=60, 20 for each participant group). The degree of interjudge agreement was calculated for each group separately to ensure that agreement was not significantly lower for any particular group. Interjudge agreement was 85 % or better for each group.

At the next stage, given the satisfactory degree of agreement among judges, the coding scheme described above was used (by the investigator) to score the responses of all the participants. Scoring was blind to the group origin of the data.

Given the element of subjectivity inherent in the judgment of the responses, further validation of the scoring was deemed to be necessary. Therefore, a random sample of 20% of coding sheets from each group was assigned to a second judge who was naïve to the hypothesis being tested and the group origin of the data. Again, the degree of interjudge agreement was calculated (using the weighted Kappa procedure) for each group separately to ensure that agreement was not significantly lower for any particular group. Interjudge agreement was 87.5 % (Cohen's Kappa=0.78) or better for each group.

Scoring the *Word Definition Test of the British Ability Scales-II*
Described in section 3.3.5

4.4. Results

4.4.1. Qualitative analysis of the children's elicited responses in the affective perspective-taking questions.

4.4.1.1. Justifications given for emotional descriptors in the questions in which a moral emotion criterion (i.e. sympathy, guilt, shame) was established

One pattern easily observed from the obtained data was that the three groups differed in the types of justifications (another's welfare; self-oriented concerns; satisfaction via another's suffering, see section 4.3.4.2 for illustrated examples); they were more likely to employ to justify their emotional descriptor for the affective perspective-taking questions for which a moral emotion criterion was previously established: The following patterns were observed:

i)   In their justifications, CD/CU children seemed less likely than CD/cu and control children to refer to another's welfare, and more likely to refer to self-oriented concerns and satisfaction deriving from others' suffering.

ii)   In contrast, CD/cu children did not seem less likely relative to controls to refer to another's welfare but seemed more likely than controls to refer to self-oriented concerns and satisfaction from others suffering.

These patterns were subsequently subjected to quantitative analysis the findings of which are presented in section 4.4.2.5.

4.4.1.2. Poor identification of sympathy by CD children

It was observed that a substantial number of CD children (n=12) had consistently failed to identify sympathy. Sympathy was variably (but consistently within individual children) misidentified as:

i) Shame, devastation, humiliation, anger with the self (blaming the self for something that they could not be responsible for). This pattern was mainly observed in children from the CD/cu subgroup.

e.g. **Ben** is at the hospital. He is ill. **David** visits him at the hospital.

Q: *How did **David** feel when he learned that his friend is ill?*

A: *Shameful. Miserable. He did not look after him properly. He could not stand what he did*

ii) Anger with others (reflecting harming of the story-victim by a non-mentioned in the story character). This pattern was observed in children from both CD groups.

e.g. **Ben** is in the Hospital. He is seriously ill. **David** goes to visit him in hospital.

*Q: How did **David** feel when he learned that his friend is ill?* (criterion emotion: sadness)

A: *Mad. Angry. Very very very angry. He is going kill him. Honestly he is going to find who passed the sickness to his friend and kill him.*

iii) Sadness (self-oriented). This pattern was observed in children from both CD groups.

e.g. Ben is in the Hospital. He is seriously ill. **David** goes to visit him in hospital.

*Q: How did **David** feel when he learned that his friend is ill?*

A: *Sad for his self. He will have to go and sit with him. He won' t be allowed to go out to play.*

iv) Happiness (reflecting satisfaction deriving from another's suffering character suffering). This pattern was observed in both CD groups.

e.g. **Jake** is going home after school when he sees a bully pushing and teasing another boy. As he watched, he saw the bully push the other boy on the road and hit him. **Jake** then went home.

*Q: How did **Jake** feel when he saw the bully teasing the other boy?*
A: *Happy, he likes to see people crying.*

4.4.1.3. Poor identification of guilt in CD children

It was observed that a substantial number of CD (n=13) children underidentified guilt. Guilt was variably (but consistently within individual children) misidentified as:

169

i) Misery, disgust, shame (directed towards self), devastation, helplessness, anger with self (for own mistake). This was mainly observed in children from the CD/cu group.

> **Tim** throws a book at his friend. His friend does not catch it and it smashes into another child's face.
>
> Q: *How does **Tim** feel?*
>
> A: *Disgusted of his self. What if he killed the other boy? He was going to be dead. Dead for ever.*

ii) Anger with others (reflecting diffusion of responsibility from self to others). A pattern which was observed in children from both CD groups.

> e.g. The teacher hears somebody talking, he thinks it was Ian and he gives him a row. But it was actually **David** who was talking. Just then David says "Sir it was me not Ian".
>
> Q: *How did **David** feel when the teacher was giving a row to Ian?*
>
> A: *Angry with the teacher. He is giving a row to Iain. Teachers are like that. They always shout.*

iii) Happiness (reflecting satisfaction deriving from succeeding in diffusing the responsibility from the self to another character. Pattern observed in children in both CD groups.

> *e.g.* The teacher hears somebody talking, he thinks it was Ian and he gives him a row. But it was actually David who was talking. Just then David says "Sir it was me not Ian".
>
> Q: *How does **David** feel when the teacher is giving a row to Ian?*
>
> A: *Happy. He managed to get away with it. He managed to get Iain to get the blame. He wasn't blamed.*

iv) Happiness (reflecting satisfaction from others' suffering caused by own action). This pattern was observed in children from both CD groups.

> e.g. **Tim** throws a book at his friend. His friend does not catch it and it smashes into another child's face.
>
> Q: *How does **Tim** feel?*
>
> A: *Very happy. He managed to hurt someone.*

4.4.1.4. Poor identification of shame in certain CD children. Overidentification of shame in others

Patterns of qualitative data revealed a tendency in specific CD children (n=7; mainly from CD/CU) to 'wrongly'' identify embarrassment in the cases where the criterion emotion was guilt or shame accompanied by a justification that did not indicate a moral implication.

> e.g. Gary sees that Elizabeth has left her purse on the desk. During the break he walks over, picks it up and takes out 10 pounds. Elizabeth and her friends come in suddenly and they stare at him
>
> *Q: How does **Gary** feel?*
>
> *A: Silly. Embarrassed. Because they are looking at him. He doesn't like people to look at him. He feels nervous.*

Importantly in other CD children (n=7, mainly from CD/cu) an opposite pattern was observed. Shame was consistently misidentified in the cases that the criterion emotions were embarrassment, sympathy, guilt or even sadness.

> e.g. Neil walks towards the school gate, when he sees one of his friends. He waves, and he does not see the gate. He bumps into the gate. Everybody stares at him.
>
> Q: *How does Neil feel?*
>
> A: *Humiliated, shameful. He wants to hide. He does not want to be noticed again by anyone.*

4.4.1.5. Overidentification of anger mainly in CD/cu children

It was observed that a substantial number of CD children (n=11) - mainly in CD/cu- consistently overidentified anger. This pattern was subsequently subjected to quantitative analysis (see section 4.4.2.5) which confirmed this pattern. Overidentification of anger variably (but consistently across individual CD children) occurred when:

i) The criterion emotion was fear (reflecting attributing intent to a character never mentioned in the story to harm the story protagonist);

> e.g. **Mark** is camping in the woods. He wakes up and he suddenly sees a poisonous snake

171

*Q: How does **Mark** feel?*

A: Angry somebody put the snake there

ii) The criterion emotion was sadness (reflecting attributing intent to a character never mentioned in the story to harm the story protagonist).

> e.g. Jake and David are friends. **Jake's** dog died
>
> Q: How does **Jake** feel?
>
> A: Angry. Somebody has poisoned his dog.

iii) The criterion emotion was embarrassment.

> e.g.: Neil walks towards the school gate, when he sees one of his friends. He waves, and he does not see the gate. He bumps into the gate. Everybody stares at him.
>
> *Q: How does Neil feel?*
>
> *A1: Angry with self because he bumps into the gate*
>
> *A2: Angry with them because they are looking at him.*

iv) The criterion emotion was sympathy (reflecting blaming the self for something that it is absolutely clear that it was not responsible), or anger with others (reflecting attributing a non-mentioned character in the story harming of the story victim by another character).

> **e.g.** Ben is at the hospital. He is seriously ill. **David** visits him at the hospital.
>
> **Q:** *How did **David** feel when he learned that his friend is ill?*
>
> *A: Angry. Very angry and disgusted. He left his enemy to pass sickness to his friend.*

v) The criterion emotion was shame (reflecting anger with others for own mistake, or diffusion of responsibility from self to others).

> **Stuart** has an injured leg and walks with crutches. **George** laughs at him and shouts to his friends: "Look at the wimp that walks with a limp". Mary, passes by, hears what George says and goes to the headteacher telling him what happened. The headteacher gets George in the assembly hall, and gives him a huge row in front of the whole school.
>
> *Q: How does **George** feel, when the headteacher gives him a row in front of the whole school?*

A: Angry with Mary. Because she told the teacher. And angry with his friends. It was their fault. They made him laugh at Stuart.

4.4.1.6. Overidentification of more extreme negative emotions in certain CD children (mainly from CD/cu)

Some CD children (n=8, mainly from CD/cu) presented a tendency to overidentify more extreme negative valence emotions (i.e. miserable, devastated, panicked, disgraceful) mainly in the cases that the emotion criterion was sadness. Of most interest was the tendency to identify shame justified by blaming the self for something that in the story was clear that was not responsible.

Jake's dog has died

Q: *How does **Jake** feel?*

A: Shameful. It's his fault. The dog died because it's his dog. Everything is his fault. He doesn't good do things. He is bad. He cannot stand it. He wants to die.

4.4.1.7. CD children more likely to attribute emotions to wrongdoers and better in justifying antisocial acts relative to 'typically-developing' controls.

One interesting pattern observed was that CD children were more likely than controls to attribute emotions to intentional wrongdoers. In addition they were much better at justifying the actions of protagonists behaving antisocially. These patterns might be suggestive of a greater ability in CD children to understand the perspective of individuals behaving antisocially.

e.g. Dan grabs **Tony**'s pencil and breaks it in two.

Q: *How does **Dan** feel **<u>after</u>** he breaks Tony's pencil?*
A; Happy. Very happy. He couldn't have done it for no reason. Tony must have done something to him and he has waited for too long to take revenge. Or if Tony hasn't done anything to him he must have been very angry. He just did it without thinking. I sometimes do things like that when I am angry. Something in my head tells me to do bad things. I am not thinking when I do it. When I calm down I regret it.

4.4.2. Quantitative Analysis

4.4.2.1. Statistical analysis

Descriptive Statistics: For data that were normally distributed, and for which the equality of variance assumption was met, Mean scores and Standard Deviations (SD) are presented. For data that were not normally distributed, and/or for which the equality of variance assumption was violated, Median scores and the Interquartile Range (IQR) are presented.

Inferential Statistics: For data that were normally distributed and the equality of variance assumption was met, within subject differences on the various factors were determined by using ANOVA for repeated measures or dependent t-tests for the pairwise comparisons. Between subject differences were determined using between subjects ANOVAs followed by Tukey's HSD procedures for the pairwise comparisons. For data that were highly skewed, or for which there was a marked heterogeneity of variance, non-parametric tests, (which assume neither homogeneity of variance nor a normal distribution), were employed. Kruskal-Wallis tests followed by Mann-Whitney U test for the pairwise comparisons were used to examine between group differences whilst the Wilcoxon Matched Pairs Signed-Ranks test was employed to determine within subject/group differences. For data that did not meet the assumptions required for ANOVA use, but involved more than two levels of a factor, the Greenhouse-Geisser Epsilon statistic was employed for overcoming the violations of the assumptions behind a normal design. This was followed by the Games and Howell (1976) Post-Hoc comparisons. The Games-Howell procedure was considered to be appropriate as it has been specifically proposed for dealing with heterogeneity of variance and unequal sample sizes.

Frequency data were analysed using the chi-square (χ^2) statistic. In the special cases of 2 * 2 contingency tables, when the expected frequencies were less than 5, the Fisher's Exact Test was utilised as an alternative to the chi-square.

In summary, the main comparisons (and relevant hypotheses) across the groups for the high and low level task were:

High cognitive skills task

i)   Cognitive perspective-taking. Deficits expected to apply in both CD groups.

ii)   Affective perspective-taking: Deficits expected to apply in both CD groups.

Low cognitive skills task

i)   'Correct' on the basis of the pre-established criteria identification of each of the tested emotions. Post-hoc hypothesis after the qualitative analysis. Both CD groups (to a greatest extent CD/CU children) expected to be less likely than controls to identify the moral emotions of sympathy, guilt and shame.

ii)   Overidentification of any particular emotion. CD/cu children expected to be more likely than both other groups to overidentify anger. Post-hoc hypothesis which emerged from the qualitative analysis.

iii)   Justifications used to justify elicited responses in questions with moral emotion criterion: CD/CU children expected to be less likely than CD/cu and control children to refer to another's welfare, and more likely to refer to self-oriented concerns and satisfaction deriving from others' suffering. CD/cu children not expected to be less likely relative to controls to refer to another's welfare, but more likely than controls to refer to self-oriented concerns and satisfaction from others suffering. Post-hoc hypothesis which emerged from the qualitative analysis.

Table 4.4. Outline of the statistical tests used to test the main hypotheses

Comparison	Test for comparison across the three groups	Test for pairwise or post-hoc comparison
High cognitive skills task: i) Cognitive perspective-taking	Kruskal-Wallis	Mann-Whitney U
ii) Affective perspective-taking	Kruskal-Wallis	Mann-Whitney U

Low cognitive skills task:		
i) 'Correct' (based on the prestablished criteria identification' of the 8 tested emotions	Mixed ANOVA. One within factor (criterion emotion) with 8 levels (sadness, happiness, anger, fear, embarrassment, sympathy, guilt and shame) and one between factor (group) with 3 levels (CD/CU, CD/cu, controls) using Greenhouse-Geisser Epsilon criterion	Games - Howell (1976)
ii) Overidentification of any particular emotion	Mixed ANOVA with one within factor (wrongly identified emotion) with 8 levels (sadness, happiness, anger, fear, embarrassment, sympathy, guilt and shame) and one between factor (group type) with 3 levels (CD/CU, CD/cu, controls), using Greenhouse-Geisser Epsilon criterion	Games - Howell (1976)
iii) Type of justification used to justify response in questions with moral emotion criteria	Two-way ANOVA, with one within factor (type of justification) with 3 levels (other's welfare, self-oriented concerns, satisfaction from other's suffering) and one between factor (group type) with 3 levels (CD/CU, CD/cu, controls), using Greenhouse-Geisser Epsilon criterion	Games - Howell (1976)

4.4.2.2. Demographic variables and verbal ability

To evaluate the equivalence of the three groups (i.e. CD/CU, CD/cu, controls), they were first compared on the following variables: age, gender and expressive vocabulary. The results of these analyses are presented in Table 4.5.

The three groups were not found to differ with respect to age. With the CD groups consisting predominantly of males, there was a significant overall difference in gender ($x^2_{(2, 111)}$= 13.93, p < 0.001). The two CD groups did not differ from each other with respect to gender.

Skewness of the data on the measure of expressive language was 1.248 (0.427) for the CD/CU group, 0.7111 (0.434) for the CD/cu group and 2.162 (0.330) for the control group. As revealed by the Kruskal-Wallis tests, the three groups differed on the measure of expressive language ($x^2_{(2, 111)}$= 6.967, p<0.031). Follow-up pairwise comparisons using Mann-Whitney U tests showed that the controls exceeded the CD/cu group in the expressive language measure (z =-2.597, p<0.009). The CD/CU

group tended to have lower expressive language scores than the controls and higher than the CD/cu group but these differences were not significant. It is conceivable that confounding effects of gender differences had an impact upon expressive language scores. It should be noted however, that when girls from the control group were excluded from the analysis control boys still exceeded the CD/cu group on the expressive language measure.

Table 4.5. Group Comparisons on Demographic Characteristics and Expressive Language

	CD /CU (n=30)	CD/cu (n=29)	Control (n=52)	Statistic	Significance level
Gender (%male)	29(97)	26(90)	34(65)	$x^2_{(2, 111)}= 13.93$	$p < 0.001$
Age. Mean (SD)	9.38(1.20)	9.32(0.86)	9.05(0.70)	$F_{(2, 108)}=1.56$	n.s.
Expressive Language. Median (IQR)	92(15)	88(22.5)	96(11.5)	$x^2_{(2, 111)}=6.967$	$p < 0.031$

CD/CU= Meeting the diagnostic criteria for CD (determined by the Revised Rutter Teacher conduct difficulties subscale (Hogg, Rutter, & Richman, 1997) elevated (upper quartile) on CU traits; CD/cu= meeting the criteria for CD low (50th percentile or lower) on CU traits; N= Number; IQR = Interquartile Range; SD=Standard Deviation; Expressive language was determined by the WD-BASII =Word Definition Test-British Ability Scales II.

4.4.2.3. Comparison of the two CD groups on clinical profile

The two CD groups were compared on the degree of their conduct problems (determined by the Rutter Conduct-Difficulties subscale), narcissism (PSD subscale), impulsivity (PSD subscale) and psychopathic tendencies (PSD total score). Table 4.6. presents the degree of skewness for each data set.

Table 4.6. Skewness of CD groups data on the degree of conduct problems, psychopathic tendencies, narcissism and impulsivity

	CD/CU	CD/cu
Degree of Conduct Problems. Skewness (SES)	-1.627 (0.427)	0.670 (0.434)
Psychopathic Tendencies. Skewness (SES)	-0.775 (0.427)	-0.175 (0.434)
Narcissism. Skewness (SES)	-0.812 (0.427)	-0.204 (0.434)
Impulsivity. Skewness (SES)	-2.259 (0.427)	-0.260 (0.434)

SES: Standard Error of Skewness

As described in Table 4.7, the CD/CU group exceeded the CD/cu group in the degree of conduct problems (z =-4.961, p<0.001, two-tailed), narcissism (z =-4.904, p<0.001, two-tailed), impulsivity (z =-5.614, p<0.001, two-tailed) and in the psychopathic tendencies (z =-6.249, p<0.001, two-tailed). On the basis of diagnostic information contained in their files, they were also compared on Asperger's syndrome, ADHD and ODD. The two groups did not differ significantly in Asperger's syndrome, ADHD and ODD diagnosis.

Table 4.7. Comparison of the two CD groups on the degree of conduct problems, psychopathic tendencies, narcissism, impulsivity, Asperger's syndrome, ADHD and ODD diagnosis

	CD/CU	CD/cu	Statistic	Significance level
Degree of Conduct Problems. Median score (IQR)	17 (3)	9 (7.25)	Z = -4.961	p<0.001
Psychopathic Tendencies. Median score (IQR)	34 (4)	18 (9)	Z =-6.249	p<0.001
Narcissism. Median score(IQR)	11.5 (3)	7 (4.25)	z =-4.904	p<0.001
Impulsivity. Median score(IQR)	10 (1)	6 (3.25)	z =-5.614	p<0.001
Asperger's syndrome. Frequency (%)	3 (10)	1 (3.45)	Fisher's Exact =0.26(two-tailed)	n.s.
ADHD diagnosis. Frequency (%)	7(23.3)	4(13.8)	Fisher's Exact =0.17(two-tailed)	n.s.
ODD diagnosis. Frequency (%)	6(20)	4(13.8)	Fisher's Exact =0.22(two-tailed)	n.s.

IQR = Interquartile Range; The psychopathic tendencies were determined by the Psychopathy Screening Device (PSD; Frick & Hare in press). Narcissism and Impulsivity were determined by the PSD subscales; the degree of conduct difficulty was determined by the Revised Rutter conduct difficulties subscale (Hogg, Rutter, & Richman, 1997). ADHD and ODD diagnosis was determined by diagnostic information contained in their files.

4.4.2.4. Affective and cognitive perspective-taking. High cognitive skills task

Skewness of the data on affective perspective-taking was 0.433 (0.427) for the CD/CU group, 0.075 (0.434) for the CD/cu group and 1.209 (0.330) for the control group. A Kruskal-Wallis test showed a statistically significant difference between the affective perspective-taking of the three groups (x^2=21.96, df=2, p<0.001). Pairwise comparisons, using the Mann-Whitney U test showed that CD/cu was outperformed by both the control (z =-4.750, p<0.001, two-tailed) and CD/CU (z =-2.115, p<0.034,

two-tailed) groups. CD/CU group was outperformed by controls (z =-2.115, p<0.034, two-tailed).

A different pattern was observed in the analysis of cognitive perspective-taking. Skewness of the data on cognitive perspective-taking was -0.233 (0.427) for the CD/CU group, 0.056 (0.434) for the CD/cu group and 1.035 (0.330) for the control group. As revealed by a Kruskal-Wallis test, the three groups differed in cognitive perspective-taking (x^2=12.41, df =2, p<0.002). Pairwise comparisons, using the Mann-Whitney U test showed that the CD/cu group was outperformed by control (z =-3.600, p<0.001, two-tailed) and CD/CU (z =-2.108, p<0.035, two-tailed) groups. CD/CU and control groups did not differ significantly in cognitive perspective-taking.

Table 4.8. Group comparisons on affective and cognitive perspective-taking. High cognitive skills task

	CD/CU	CD/cu	Control	Statistic	Significance level
Affective perspective-taking. Median (IQR)	4.5(3)	4(2.25)	5.5(1.75)	$x^2_{(df=2)}$=21.96	p<0.001
Cognitive perspective Taking. Median (IQR)	5(2)	4(2)	6(1)	$x^2_{(df=2)}$=12.41	p<0.002

4.4.2.5. Affective perspective-taking: Low cognitive skills task

1. 'Correct' identification of emotions

Using the pre-established criteria, the three groups were first compared on the 'correct' (according to the criteria) identification of the 8 tested emotions. A mixed ANOVA with one within factor (criterion emotion) of 8 levels (sadness, happiness, anger, fear, embarrassment, sympathy, guilt and shame) and one between factor (group type) with 3 levels (CD/CU, CD/cu, controls) using Greenhouse-Geisser Epsilon criterion, revealed significant main effects of the criterion emotion (F $_{(5.5, 594.6)}$ = 56.162, p<0.001), group (F $_{(2, 108)}$ = 9.58, p<0.001), and a group by criterion emotion interaction F $_{(11.01, 594.6)}$= 6.15, p<0.001).

Follow-up pairwise comparisons using Games and Howell's (1976) procedure indicated that the CD/CU group was more likely than the CD/cu (p<0.014) and

179

control groups ($p<0.001$) to underidentify fear. The CD/cu group did not differ significantly from the control group in the identification of fear. The CD/CU group was also significantly more likely than the controls to underidentify sympathy ($p<0.001$) and guilt ($p<0.001$). The CD/cu group presented intermediate patterns, being significantly more likely than the CD/CU group (guilt, $p<0.024$, sympathy. $p<0.031$) and significantly less likely than the controls (guilt, $p<0.014$, sympathy, $p<0.028$) to identify guilt and sympathy. The three groups were not found to differ in identifying sadness, happiness, anger, embarrassment and shame.

2. Overidentification of particular emotions

Following the pattern emerging for the qualitative analysis in which CD/cu children seemed to overidentify anger not at random, the three groups were compared on their tendency to overidentify a particular emotion. That is, the extent to which they wrongly overidentified a particular emotion not at random. The dependent variable in this analysis was, therefore, the number of errors that the participant made by wrongly identifying each of the tested emotions.

A mixed ANOVA involving one within factor (wrongly identified emotion) with 8 levels (sadness, happiness, anger, fear, embarrassment, sympathy, guilt and shame) and one between factor (group type) with 3 levels (CD/CU, CD/cu, controls), using Greenhouse-Geisser Epsilon criterion revealed a significant main effect of the type of overidentified emotion ($F_{(5.5, 594.6)} = 15.236$, $p<0.001$), group ($F_{(2, 108)} = 3.571$, $p<0.031$), and group by criterion emotion interaction $F_{(9.18, 495.6)} = 7.705$, $p<0.001$).

Follow-up pairwise comparisons using Games and Howell's (1976) procedure indicated that the CD/CU group was significantly more likely than the controls ($p<0.042$) to overidentify happiness. The CD/cu group was significantly more likely than the CD/CU ($p<0.006$) and the controls ($p<0.001$) to overidentify anger. No other pairwise comparison was significant.

180

3. Types of justification given for emotional descriptors in the questions in which a moral emotion criterion (i.e. sympathy, guilt, shame) was established

The pattern observed in the qualitative analysis of group differences in the types of justification given for emotional descriptors in the questions in which a moral emotion criterion (i.e. sympathy, guilt, shame) was established was subjected to qualitative analysis. A two-way ANOVA was performed on the data, and consisted of one within factor (type of justification) with 3 levels (self-oriented concerns, another's welfare, satisfaction deriving from another's suffering) and one between factor (group type) with 3 levels (CD/CU, CD/cu group, controls). The Greenhouse-Geisser Epsilon criterion revealed a significant main effect of the type of justification ($F_{(1.19, 128.6)} = 817.67$, $p < 0.001$), group ($F_{(2, 108)} = 3.57$, $p < 0.032$) and group by type of justification interaction (($F_{(2.38, 128.6)} = 30.67$, $p < 0.001$).

Follow-up, pairwise comparisons using Games and Howell (1976) procedure revealed that the CD/CU group was less likely than the controls ($p < 0.001$) and CD/cu group ($p < 0.001$) to give justifications in which the protagonist's emotions were explained with reference to another's welfare. The CD/cu group and the controls did not differ significantly in the frequency they referred to another's welfare. The CD/CU group was more likely than the controls ($p < 0.001$) and the CD/cu group ($p < 0.005$) to give a justification in which the protagonist's emotions were explained with reference to pleasure deriving from the other character's suffering. The controls were less likely than the CD/CU ($p < 0.001$) and the CD/cu group ($p < 0.01$) to give justifications in which the protagonist's emotions were explained with reference to satisfaction deriving from another's suffering. No other pairwise comparisons were significant.

181

4.5. Discussion

4.5.1 Summary of Results

In the present cross-sectional investigation, three groups (i.e. CD/CU, CD/cu, controls) of children (aged 7.6-10.8) were firstly compared on cognitive and affective perspective-taking using a false-belief task requiring relatively high cognitive skills. Results indicated that CD/cu children were inferior in cognitive perspective-taking relative to controls and to CD/CU children. The CD/CU children tended to score lower relative to controls but not to a statistically significant degree. On affective perspective-taking both CD groups were inferior to controls, and the CD/cu children were inferior to the CD/CU children.

Then the three groups were compared on affective perspective-taking using a simple emotion interaction stories task, requiring limited cognitive skills. The groups did not differ in respect to the 'correct' identification of sadness, happiness, anger, embarrassment and shame, but differed in the 'correct' identification of fear, guilt and sympathy. CD/CU children were less likely than both the controls and CD/cu children to 'correctly' identify fear. CD/CU children were less likely than controls to identify guilt and sympathy. CD/cu children were significantly less likely to identify guilt and sympathy relative to controls, and significantly more likely relative to CD/CU children. Finally, CD/cu children presented a tendency to 'overidentify' anger and CD/CU children to overidentify happiness.

4.5.2. Cognitive and affective perspective-taking in the high cognitive skills task

Conceptually, deficits in affective and/or cognitive perspective-taking have long been implicated in CD (e.g. Kohlberg et al., 1972; Gough, 1948; Hare, 1970). These expectations, however, have not been conclusively supported by empirical investigations. On the one hand, an extended body of empirical literature (e.g. Chandler, 1973; Chandler et al., 1974; Cohen & Strayer, 1996; Lee & Prentice, 1988; Kaplan & Arbuthnot, 1985; Little, 1978; Minde, 1991; Waterman et al., 1981; Rotenberg, 1974) has documented an association between persistent patterns of antisocial conduct and deficits in perspective-taking. On the other hand, a substantial body of empirical findings (e.g. Happé & Frith, 1996; Waterman et al., 1981)

challenged the link between persistent patterns of antisocial conduct and perspective-taking deficits. Current preliminary findings, if replicated, assist in explaining the conflicting findings across investigations by suggesting that the findings might be linked to the significant variation among CD children, coupled with a distinct operation of cognitive and affective perspective-taking. Present data suggest that CD subgroups present differentiated affective and cognitive perspective-taking abilities. However, the CD samples of the present investigation derived from specific settings (i.e. EBD schools). Therefore, the findings should be generalised with caution across the wider population of CD children.

The present data on affective perspective-taking revealed deficits in both CD samples of the present investigation compared with average 'typically-developing' controls. These findings extend downwards in age, and across more complex cognitive requirements the deficits in affective perspective-taking (in tasks requiring low cognitive skills) identified by Cohen and Strayer (1996) in a population of clinically identified CD adolescents (aged 14-17) and by Waterman *et al.* (1981) in institutionalised CD boys (aged 10.3). The present findings also extend upwards the affective perspective-taking deficit identified by Minde (1991) in a clinic population of CD preschoolers (aged 4-4.5).

In contrast, MacQuiddy *et al.*, 1987 reported no affective perspective-taking deficits in parent identified CD children (aged 5-7 years). There are at least three plausible explanations for the discrepancies between the findings by MacQuiddy *et al.* (1987) and those of Minde (1991), Cohen and Strayer (1996), Waterman *et al.* (1981) and the current study:

i)   Sample selection procedures. In the study by MacQuiddy and colleagues, CD children were parent-identified. It has been argued that parents are not the most adequate informants of their children's conduct problems (see Elander & Rutter, 1996). In contrast, the present investigation and that of Waterman *et al.* (1981) did not utilise parents as informants but rather identified CD only within schools for children with EBD. Minde's (1991) and Strayer and Cohen's (1996) samples were clinically identified;

ii)   Sample size. The sample size of the study by MacQuiddy *et al.* was small (11 non-behavioural problem boys and 12 CD boys) and therefore possible differences may have not been detected;

iii)   Age. It may be that differences in affective perspective-taking are not so pronounced in younger children, but get more prevalent as children get older. However, this possibility seems less likely, as the sample by Minde (1991) was even younger (4-4.5 years) and still differences between CD and control children were evident.

Turning to cognitive perspective-taking, present findings suggest that deficits do not apply across CD populations in a uniform pattern. In their cross-sectional study, Happé and Frith (1996) reported no evidence of cognitive perspective-taking deficits in CD children (aged 6-12 years) relative to 'typically-developing' controls (aged 7-9). The study by Happé and Frith, however, suffered from two weaknesses. It used a small sample size (18 CD children and 8 controls) and first order false-belief tasks. The former makes it less likely that any differences will be detected; the latter increases the likelihood of ceiling effects. As Baron-Cohen *et al.*, (1997) stress, first-order false-belief tasks are not complex enough, and are therefore vulnerable to ceiling effects if used with individuals of mental age above 6. Apart from these two weaknesses, the study by Happé and Frith (1996) was not designed to examine possible variations in CD children.

Considered cumulatively, the patterns of findings on both cognitive and affective perspective-taking in this high cognitive skills task allow a number of tentative, conclusions to be drawn. Firstly, it is possible that the inferior affective perspective-taking of the CD/cu children relative to both other groups, is significantly connected to cognitive factors. It might derive from a diminished ability to infer the thoughts that generated the emotions. This speculation is based on the finding that, in this group (i.e. CD/cu), deficits in the understanding of the differing characters' emotions were accompanied by deficit in the understanding of characters' thoughts. Given that understanding of the characters' emotions depends on the understanding of their thoughts, it is reasonable to assume that lower capacity of an individual to

understand another's thought might preclude understanding of the generated emotion without necessarily any deficit in emotion understanding per se.

A second conclusion is that, given that CD/CU children have shown inferiority relative to the controls in affective but not in cognitive perspective-taking, and superiority over the CD/cu children in both cognitive and affective perspective-taking, it seems that their superiority over the CD/cu children derives from a relatively greater capacity in understanding others' thoughts, rather than others' emotions. Given that, in the present samples, CD/CU children were found to exhibit relatively more severe patterns of antisocial behaviour than their CD/cu counterparts, this interpretation seems difficult to reconcile with the findings of Waterman et al., (1981) who found that affective but not cognitive perspective-taking superiorities are related to more serious patterns of antisocial behaviour in CD children.

There are, however, two substantial differences between the present study and that of Waterman et al. (1981), sample selection and measures. In the present study, two groups of children that met the criteria for CD were recruited in schools for children with EBD. These groups represented the two extremes (upper quartile vs. 50th percentile or lower) in terms of the presence or absence of CU traits. Whereas, in the Waterman et al. (1981) study, all children attending a class of a school for children with EBD were tested, and the results reported were correlational. In other words, the Waterman et al. sample may not all have met the criteria for CD. Secondly, in their study, cognitive and affective perspective-taking abilities were assessed by two distinct tasks. Cognitive perspective-taking was assessed by the Flavell et al. (1968) perspective-taking logic task. As previously argued, (see section 4.2.) this task mostly taps problem-solving skills rather than cognitive perspective-taking. Affective perspective-taking was assessed by Waterman et al. (1981) with the use of a distinct task. They used videotaped scripts portraying social interactions in which children had to identify the portrayed simple or complex emotion. In contrast, in the present investigation cognitive and affective perspective-taking were assessed within the same context and around the same social situation. The advantage of the same context task is that cognitive and affective perspective-taking are interdependent and it therefore allows the detection of a possible disjunction between the two. In other

words, for the child to understand the character's emotion (affective perspective-taking) s/he also had to understand the thought of the protagonist that generated this emotion (cognitive perspective-taking).

A more general conclusion also emerges. CD/CU children were not found to show deficits in cognitive perspective-taking relative to controls. This suggests that cognitive perspective-taking competency does not prevent antisocial behaviour. Similar conclusions (i.e. that perspective-taking competency does not prevent antisocial behaviour) have been reached by other empirical investigations examining antisocial behaviour in normative samples (e.g. Sutton *et al.*, 1999b; Sutton *et al.*, 2000). Some investigators (see Sutton, Smith, & Swettenham, (1999a) have gone even further to argue that in certain children who show antisocial behaviour populations (i.e. bullies), perspective-taking superiorities result in greater antisocial acts. Present data have shown that CD/CU children exhibit relatively more severe antisocial behaviour than their CD/cu counterparts. Similarly, in a normative sample, Silvern 1976 (as cited by Waterman *et al.*, 1981) reported that, among 10-11 year-old boys, superior cognitive perspective-taking was associated with relatively more severe antisocial behaviour. However, present data are only cross-sectional. So aetiology cannot be established. It is possible that superior perspective-taking and more serious patterns of antisocial behaviour in CD children evolve from similar (or possibly different) sources and develop contemporaneously.

There are at least two plausible explanations for the cognitive perspective-taking competence of CD/CU children, accompanied by deficits in their affective perspective-taking. One explanation might be that this group demonstrates an affective-specific deficit, perhaps underlined by (or related to) to the deficit in affective empathy (i.e. capacity for vicarious affective responding) evident in study 2 (based on the theoretical assumption that the two dimensions of empathy interact; see Hoffman, 1984). It seems that this group presents a disjunction between purely cognitive (i.e. cognitive perspective-taking) and affective (i.e. capacity to get vicariously aroused with another's affective state) dimensions of empathy. A second explanation might be that this CD group, and not necessarily only this CD group, shows social cognitive deficits in areas other than the cognitive perspective-taking

tapped by the present task. For example, empirical data have provided corroborative evidence for social problem-solving deficits in CD samples (e.g. Joffe, Dobson, Fine, Marriage & Haley, 1990; Minde, 1991). In addition, it may be that these children manifest dissociation between age-appropriate perspective-taking and moral reasoning. Long ago, Selman (1971) argued that age-appropriate perspective-taking is necessary but not sufficient for adequate moral reasoning. Inferior moral reasoning among children and adolescents with persistent conduct problems has been well documented across time and reporters (for a review see Smetana, 1990).

On the other hand, the relative deficit in both affective and cognitive perspective-taking in CD/cu children should not be interpreted as implying either a causal relationship or that inferior perspective-taking can solely account for the patterns of behaviour they exhibited. Firstly, as discussed above, present data are only cross-sectional, and therefore issues of causality are not elucidated. Secondly, perspective-taking deficits are not restricted to CD/CU children. Poorer performance is characteristic of other clinical child and adolescent samples (e.g. Pervasive Developmental Disorder-PDD, Non-verbal Learning Disorder-NLD, Hyperlexia; see Winner, 2002) and this deficit does not lead them to show antisocial conduct of clinical significance. Significant variations in perspective-taking are also seen in normative child and adolescent samples.

4.5.3. Affective perspective-taking in the low cognitive skills task

When asked to identify the most likely felt emotion experience by a character across a series of simple stories, requiring limited cognitive skills, the three groups did not differ in the 'correct' identification of sadness, happiness, anger embarrassment and shame. CD/CU children, were less likely than both other groups to 'correctly' identify fear. Both CD groups, but especially CD/CU children, were also less likely than controls to 'correctly' identify sympathy and guilt. CD/cu children were more likely than both other groups to overidentify anger. CD/CU children were more likely than both other groups to overidentify happiness.

Two tentative conclusions could be drawn from these results. It has been previously suggested (see section 4.5.2) that the inferiority of CD/cu children in affective

perspective-taking in the false-belief task may to a significant extent be linked to cognitive perspective-taking deficits. The data of the current task, however, also reveal evidence of emotion-specific effects in this group. While they had no difficulty relative to controls in identifying the emotions of sadness, happiness, anger, embarrassment and shame, they showed a clear difficulty relative to controls in identifying sympathy and guilt. At the same time they showed a clear tendency, relative to both other groups, to overidentify anger.

A second tentative conclusion can be drawn with respect to the CD/CU children. In the false-belief task, this group demonstrated affective but not cognitive perspective-taking deficits. It was therefore suggested (see section 4.5.2) that they seem to present an affective-specific deficit. In this simple task, however, CD/CU children did not show any deficit in apprehending sadness, happiness, anger, embarrassment and shame. This finding suggests that CD/CU children might not have global generated emotion deficits – given that they have shown relative competency in identifying some emotions. But, at the same time it has provided some more support for affective nature deficits. If present preliminary data are replicated, deficits appeared to be linked with specific emotions. CD/CU children seem to have some specific emotion deficits related to the underidentification of fear, sympathy and guilt.

Interpretation of all these patterns of findings is made under one important proviso. Emotion by its nature it is a subjective experience. As Eisenberg argues, 'emotions, express a personal, polarised and biased perspective' (Eisenberg, 2000, p.665). This subjectivity inherent in the emotional experience warrants particular caution in the interpretation of findings. For instance, failure to identify the most likely emotion might be interpreted in various ways. For example, it might variously reveal: **i)** failure to apprehend; **ii)** a projection of own emotion (which may or may not be suggestive of some form of deficit in experiencing the particular emotion); **iii)** a biased view due to socialisation practices of what s/he expects an individual to experience in a particular evocative situation; **iv)** a lack of tendency to consider others' emotions, or even; **v)** linguistic failure. Consequently, the interpretation that follows, in terms of the nature of the deficits, is strictly speculative.

4.5.3.1 Identification of the 'primary' emotions of sadness, happiness, anger and fear

It seems that neither of the CD groups presented any deficit relative to the average children in identifying what are considered to be 'primary emotions' of sadness, happiness and anger. Such emotions are believed to predate human evolution and clearly related to survival (Ekman, 1971, 1991; Panskepp, 1982; Plutchick, 1980).

However, CD/CU children were less likely to correctly identify the 'primary emotion' of fear. If this failure is caused by a difficulty in apprehending this emotion, then it becomes likely that, in real life situations and perhaps in an aggressive encounter with another child, they may fail to recognise that the attacked child is fearful. Furthermore, if they have a deficit in experiencing fear, then they may be more likely to approach a fear-inducing situation. Likewise, in aggressive encounters with others, their absence of fear may not mitigate their aggressiveness.

In support of these assumptions, neurophysiological data suggest a deficit in the neurophysiological systems modulating fear, mainly in the adult psychopath, but also in the child who shows traits characterised as CU or psychopathic (see Trasler, 1978; Gray, 1987; Fowles, 1988; Patrick, 1994). Further evidence is provided by behavioural data. In the adult psychopathological literature, there is evidence to suggest that antisocial adults, who also show CU traits in contrast to other antisocial individuals, show diminished fearfulness (Hare, Hart & Harbur, 1991). In an analogous way, an emerging body of empirical findings (e.g. Frick *et al.,* 1994b; Frick *et al.,* 1999; O' Brien & Frick, 1996) has shown behaviour in CD/CU children that has been interpreted as indicative of low fearful inhibition. For instance, CD/CU children have shown high levels of thrill and adventure seeking (i.e. fearlessness; Frick *et al.,* 1994b, Frick *et al.,* 1999) and diminished responsiveness to punishment cues (O' Brien & Frick, 1996). This is not to say that the patterns of behaviour in the CD/CU children can be solely explained by diminished fearfulnesses and/or some form of deficit in apprehending fear. CD/cu children did not show any similar pattern and they still exhibit antisocial behaviour.

Overidentification of anger in CD/cu children

The qualitative analysis revealed that a substantial number of CD children, mostly from the CD/cu group, often overidentified anger with others when the criterion emotion was fear; anger with self or anger with others when the criterion emotion was embarrassment; anger with self or anger with others when the criterion emotion was sympathy; and anger with self or others when the criterion emotion was shame. Subsequent quantitative analysis (see section 4.4.2.5.) has revealed that CD/cu children overidentified anger.

Some of the above patterns of qualitative data warrant further discussion.

i) Anger against others for own misdeeds.

This finding accords with a shifting blame factor (i.e. avoidance of responsibility that involves transfer onto another person) implicated in conduct problems in a normative sample of children (aged 11-13 years) in the work of Sutton *et al.*, (2000), and in college students in the work of Powell, Rosen, and Huff (1997).

It has been previously argued (see section 4.5.2) that conduct problems in CD/cu children cannot be simply explained by deficits in perspective-taking. Powell and colleagues (1997) speculate that avoidance of responsibility decreases the feeling of guilt or remorse for the CD individual's actions, and allows him/her to avoid responsibility for his/her misbehaviours. This speculation receives some support from three patterns found in the current data for CD/cu children: **a)** overidentification of anger with others for own misdeeds; **b)** underidentification of guilt, and; **c)** being not less likely than control children to refer to others' welfare in their justification in the moral emotion criteria questions. It is plausible that diffusion of responsibility helps a significant number of CD/cu children to avoid feelings of guilt, and thereby continuing their misconduct. Their ability to experience guilt seems to be indicated in not having a diminished tendency to refer to others' welfare in their justifications. Diffusion of responsibility, may indeed play a significant role in the misbehaviour of many CD children and warrants further investigation.

ii) Anger against characters never mentioned in the story

A second pattern of interest is the overidentification of anger justifying it by inventing another character (never mentioned in the story) who has hostile intent against the protagonist. This finding accords with the work of Dodge and colleagues (e.g. Dodge, 1980; Dodge & Somberg, 1987) who found that aggressive children are more likely to show unwarranted, hostile attribution bias (i.e. they overattribute hostile intent to other's actions). This finding was more recently found to be more salient in reactive rather than in proactive aggression (Crick & Dodge 1996; Dodge & Coie, 1987). In the same way, present data revealed that the tendency to overidentify hostile intent was more pronounced in CD/cu children and low levels of CU traits have previously been suggested to be associated predominantly with reactive forms of aggression (Frick & Ellis, 1999).

The overidentification of anger (which may reflect proneness to anger) and the patterns of blaming others and overidentification of hostile intent all of which coincided in CD/cu, are plausibly connected with each other. In situations that involve provocation or harm, self-reported individual differences in feelings of anger have been found to be associated with blaming others (Quigley & Tedeschi, 1996) and to mediate between attributions of intentionality and non-constructive aggression reactions to the provocateur (Graham, Hudley, & Williams, 1992; Graham, Weiner & Zucker, 1997).

One example of how proneness to anger, in conjunction with its weak regulation, may lead to social incompetence is the possible relation between anger management and aggression. Individual differences in the intensity of anger reactions have been associated to the degree to which children's reactions to anger are constructive (Eisenberg, Fabes, Nyman, Bernzweig, & Pinuelas, 1994b). It has been shown that individuals who are highly emotional in response to anger-inducing events and low in regulation are likely to show aggression (Eisenberg, Fabes, Bernzweig, Karbon, Poulin, & Hanish, 1993, 1994a; Fabes & Eisenberg, 1992). Eisenberg and colleagues hypothesise that the intensity of anger is related to a loss of behavioural control. Children who fail to employ such strategies such as attentional control, avoidance,

and instrumental coping to vent their emotions are believed to react aggressively (Eisenberg *et al.,* 1993, 1994b).

In general, anger/frustration seems to be predictive of persistent antisocial conduct. Anger proneness in infancy, as rated by mothers (Goldsmith, 1996) or observed in the laboratory (Rothbart, Ahadi, & Hershey, 1994), was predictive of aggression at a later stage in age (i.e. in preschool or school years). Further, self-reported anger among high school children was predictive of delinquency 9 months later, even when controlling for earlier levels of delinquency (Colder & Stice, 1998).

Furthermore, children prone to intense and frequent negative emotions (usually operationalised as a blend of negative affective states such as dysphoria, anger, and anxiety) have been found to exhibit relatively high levels of conduct problems (e.g. bullying, stealing, and lying) (Eisenberg *et al.,* 1996a; Stice & Gonzales, 1998). In general, the association between temperamentally negative emotionality and CD has been well documented across time and reporters (e.g. Eisenberg, Fabes, Murphy, Maszk, Smith & Karbon, 1995b, Eisenberg, Fabes, Shepard, Murphy, & Guthrie, 1997a; Eisenberg, Guthrie, Fabes, Shepard, Losoya, Murphy, Jones, Poulin, & Reiser, 2000; Lengua, West, & Sandler, 1998).

4.5.3.2. 'Social' emotions of sympathy, guilt shame and embarrassment

Moving from what have been called the 'primary' to 'secondary' or 'social' emotions (see Izard, 1991, for another perspective) of sympathy, guilt, shame and embarrassment, response patterns across these emotions differed. Neither of the CD groups has shown difficulty relative to controls in identifying shame and embarrassment. However, both groups, (mostly CD/CU), showed some difficulty in identifying sympathy and guilt, which are considered to be higher-order emotions implicated in theories of morality (e.g. Hoffman, 1998; Walker & Pitts, 1998). This finding accords with a study by Asendorpf and Nunner-Winkler (1992) who found that, in a normative sample of elementary school children, those who were less likely to attribute moral emotions to story protagonists were also more likely to engage in antisocial behaviour. This finding may indicate a specific morally appropriate perspective-taking deficit in CD children.

i) Sympathy

Conceptually, sympathy has been viewed as a fundamental other-oriented moral emotion, fostering intentional moral behaviour. It is considered to consist of feelings of sorrow or concern for the other, and to stem from affective empathy (vicarious affective responding) (Eisenberg *et al.*, 1994a) and/or cognitive perspective-taking (Eisenberg, 2000; see also section 2.4).

Empirical links between sympathy and morally appropriate behaviour have been demonstrated at varying degrees (usually depending on the measures of assessment), in research with adult (e.g. Batson, Sager, Garst, Kang, & Rubchinsky, 1997; Penner & Finkelstein, 1998; Trobst, Collins, & Embree, 1994) and child and adolescent samples (e.g. Carlo, Roesh, & Melby, 1998; Eisenberg *et al.*, 1991b; Eisenberg, Carlo, Murphy & Van Court, 1995a; also see Estrada, 1995; Roberts & Strayer, 1996; Eisenberg & Fabes, 1998; Eisenberg, Guthrie, Murphy, Shepard, Cumberland, & Carlo, 1999). In addition, dispositional sympathy has been associated with low levels of conduct problems in childhood and adolescence (Carlo *et al.*, 1998; Cohen & Strayer, 1996; Tremblay, Pihl, Vitaro & Dobkin, 1994).

The present investigation has shown deficits in both CD subgroups, particularly in the case of CD/CU children, in identifying sympathy. As described above, sympathy is considered to stem from affective empathy (Eisenberg *et al.*, 1994a), but may also be based on cognitive perspective-taking (Eisenberg, 2000; see also section 2.4). Given that the CD/CU children in study 2 have shown deficits in affective empathy (assumed to engender sympathy; see Eisenberg *et al.*, 1994a), but not in cognitive perspective taking, the deficit in identifying sympathy may derive from this affective-specific effect. In contrast, CD/cu children have shown no evidence of deficits in affective empathy, but have shown evidence of deficits in cognitive perspective-taking, which is also considered to be implicated in sympathy (see Eisenberg *et al.*, 1994a). Consequently, it might be speculated that the weakness in identifying sympathy in CD/cu children, to a significant extent, may be linked to cognitive taking-taking deficits; although other causes are not ruled out. For instance, the lack of deficit in the capacity for affective empathy in CD/cu children does not

ensure that affective empathy has turned into sympathy (as would be predicted by Eisenberg's model; see Eisenberg *et al.*, 1994a), which would lead to intentional moral conduct (as would be predicted by Hoffman's model of empathy motivated moral conduct, see discussion chapter 3). Qualitative data revealed, for example that certain children attributed to characters observing others in distress, for instance, self-oriented sadness. If these response patterns are assumed to reflect projection of one's own emotions, they may in fact provide preliminary evidence that, in such children, an empathic response might never turn to sympathy.

More generally, patterns in the present qualitative data have revealed that the emotion of sympathy was variably (but consistently within individual children) marked by diverse nature distortions. For instance, sympathy has been misidentified as shame, devastation, sadness (self-oriented), anger with the self and anger with others, happiness (satisfaction from non-liked character suffering). If these variable misidentifications reflect a projection of the attributor's own emotions, then some- but not all- may be implicated in the patterns of behaviour exhibited by the specific CD children who make the misidentifications. For example, an individual who observes someone's suffering and gets satisfaction out of it may be inclined to induce suffering in others. Or, one who observes another person's suffering and is centred only in self-oriented concerns will perhaps not inhibit antisocial conduct. On the other hand, it is difficult to explain why a child that misidentifies sympathy with shame, devastation, or anger against the self because somebody was sick, and at the same time attributes responsibility to his/her self for not looking him after properly would be inclined to react in an antisocial manner.

ii) Guilt

Guilt, along with shame and embarrassment, have been labelled as 'self-conscious' emotions (Ferguson & Stegge, 1998) because the individual's understanding and evaluation of the self are fundamental to these emotions. Among the self-conscious emotions, guilt was the one that was underidentified by CD children, especially by the CD/CU children. Guilt often refers to regret over harming someone. For example, it has been defined as 'an agitation-based emotion or painful feeling of regret that is aroused when the actor actually causes, anticipates causing, or is associated with an

aversive event' (Ferguson & Stegge, 1998, p.20). The guilty individual assigns responsibility to the self for a behaviour that violates internalised standards or causes another's distress, and desires to make amends or punish the self (Ferguson & Stegge, 1998; Hoffman, 1998; Tagney, 1991).

Importantly, the emotion of guilt was variably (but again consistently within individual children) misidentified as misery, disgust (directed towards self), devastation, helplessness, anger with self (for own mistake), anger with others (diffusion of responsibility from self to others), embarrassment, shame, happiness (satisfaction of diffusing responsibility or causing suffering), happiness (reflecting satisfaction from others suffering caused by own action). Again, if these patterns reflect a projection of the attributor's own emotions, they may be implicated in the failure of specific CD children (i.e. who made the misidentifications) to inhibit their antisocial conduct. For instance, an individual who feels disgusted with his/her self, miserable, devastated or helpless may reveal a passive approach, which presumably might not lead to the amendment of a moral transgression or an active decision not to repeat the transgression. While guilt reveals desire to undo aspects of behaviour (Niedenthal, Tangney, & Gavanski, 1994) these passive emotions seem to reveal a wish to undo characteristics of the self.

iii) Shame

Shame has in the past been used as a synonym for guilt. More recently, investigators have drawn a distinction between guilt and shame. This distinction may, to some extent, help explain the relative competency of both CD groups in identifying shame as revealed by quantitative data. At the same time, patterns of qualitative data that revealed that certain CD children, mainly from the CD/cu group, misidentified shame when the criterion emotion was sympathy, sadness, embarrassment or guilt.

It has been argued that what distinguishes shame from guilt is that shame is considered as '...a dejection-based, passive, or helpless emotion aroused by self-related aversive events. The ashamed person focuses more on devaluing or condemning the entire self, experiences the self as fundamentally flawed, feels self-

195

conscious about the visibility of one's actions, fears scorn, and thus avoids or hides from others' (Ferguson & Stegge 1998, p. 20).

Many theorists and investigators hold that guilt and shame (at least defined as above) are two distinct emotions and that an important difference between them is in the degree of focus on the self (Lewis, 1971; Tangney, 1998). When a person experiences shame, the entire self feels exposed, inferior and degraded. Adults report that shame experiences are more painful and intense than are guilt experiences, and are associated with a preoccupation with others' opinions. In contrast, guilt is less painful and devastating than shame because, when one experiences guilt, the primary concern is the particular behaviour which is separate from the self (Ferguson, Stegge & Damhuis, 1991; Tangney, 1998). Guilt engages remorse and regret, but does not influence one's core identity. Shame involves the desire to undo aspects of the self, whereas guilt involves the desire to undo aspects of behaviour (Niedenthal *et al.*, 1994).

Empirical data provide some preliminary support that shame is less linked than guilt to moral behaviour. Shame, but not guilt, is likely to evolve from non-moral situations (e.g. failure in performance situations or socially inappropriate behaviour), and shamed individuals are relatively less likely to try to restore their transgression. (Tangney, 1998). Whereas guilt, being more focused on the transgression than the self, seems to activate restoration, admission and apologising rather than avoidance (Tangney, 1998). However, the results of this work (i.e. Tangney, 1998) should be treated with particular caution because guilt has been defined as a reparative response, so these associations are perhaps not surprising.

Shame and guilt also appear to be differentially associated to sympathy-related responding. Tangney (1991) reported that guilt was positively related to adults' self-reported empathic responsiveness, whereas shame was negatively related, especially when controlling for guilt. Shame was especially associated with personal distress reactions (i.e. aversive, self-focused reactions to others in need or distress). However, as guilt and shame are significantly correlated and these analyses were partial correlations controlling for one another, it is possible that the distinction between guilt and shame is not as clear-cut as Tangney's (op cit) findings indicate.

The distinction between guilt and shame does provide a partial, but not adequate explanation for the qualitative data revealing that certain CD children, mainly from the CD/cu group, have consistently misidentified shame when the criterion emotion was sympathy, sadness, embarrassment or guilt. These consistent misidentifications perhaps have to do with how these particular CD children feel about themselves. But for patterns to be elucidated, more controlled empirical investigations need to be employed dealing specifically with link between shame and CD. In these investigations, variation among CD children would need to be dealt with, as the present investigation has shown a consistent pattern of repetitive misidentification of shame in the place of other criterion emotions in some, but not across most CD children in a uniform pattern.

iv) Embarrassment

Turning to the final 'self-conscious' emotion of embarrassment, present quantitative data showed relative competency of both CD subgroups in identifying this emotion. However, the qualitative data revealed that specific CD children, mainly from the CD/CU subgroup, tend to misidentify embarrassment in the cases where the criterion emotion was guilt or shame.

These patterns might be explained by research consistent with the conclusion that embarrassment, in comparison to shame and guilt, is the least negative, least serious, and most transitory emotion (see Miller & Tangney, 1994). Also, it is the least related to moral implications, and involves less concern in making amends. Additionally, it often involves accidental events for which individuals feel less responsible (Miller & Tangney, 1994). Instead of playing a role in morality, embarrassment may function to appease others for one's transgressions of social convention by eliciting light-hearted emotion (Keltner, 1995) or may prevent loss of face (Leary, Landel & Patton, 1996; Miller & Leary, 1992). Thus, there seems to exist a relative agreement that embarrassment does not play such an important role in moral conduct.

It should be noted, however, that the qualitative data did not point unanimously towards misidentification of embarrassment with a more morally linked emotion by certain CD children. For instance, as discussed above (see section 4.4.1.4) a number of CD children (n=7), in contrast to those who misidentified embarrassment instead

of guilt or shame, showed a reversed tendency. They misidentified devastation, humiliation and shame when the criterion emotion was embarrassment. These patterns may reveal that, within the population of CD children, there appears to exist a much greater diversity than implied in subclassification systems. This, in turn, points towards the need for an individual approach in interventions.

4.5.4. Limitations

A series of methodological limitations may have had an impact on the patterns of results obtained in the current investigation. Starting from the measurement instruments, several methodological problems apply to the tasks used to assess affective perspective-taking: Firstly, given the subjective nature of emotional experience, there are problems inherent in the tasks in which children are asked to infer others emotions in the context of a story. Such tasks, in which children's responses are judged against pre-established conventional criteria in terms of the most likely felt emotion in each particular situation, might underestimate the true ability to understand others' emotions in children who are likely to give less conventional answers. It might be, for instance, that the results are a function of perhaps diminished likelihood in CD children to attribute more 'conventional' stereotypical affective states to others. Of course, attributing less 'conventional' affective states to others might mean that in the conventional world they live in, they have comparatively diminished chances to understand others' emotions.

A further limitation applies to the coding scheme used in the affective perspective-taking task (simple-stories task), in which set criteria were given to the judges against which children's answers would be judged. This coding scheme was considered to be necessary but perhaps not the most optimal (given the subjective nature of emotional experience) as it ignored valuable information in certain CD children's answers, with the possible consequence of having underestimated the true ability of certain CD children in understanding others' emotions. The attempts made to develop a coding scheme without giving set criteria to the judges had low inter-rater agreement and therefore could not be used. The differing perspectives of the judges, in conjunction with the subjectivity of emotional experience, kept the

agreement among them particularly low. Without set criteria in terms of the most likely felt emotion for each particular situation, some judges found it difficult to judge children's responses without projection of their own emotions to a particular situation. For others it seemed difficult to judge without expectations of stereotypical conventional answers. Still for others, it seemed difficult (perhaps unavoidable) to judge without biased perceptions in terms of expectations of a moral response (for more details see section 4.3.4.2). The approach that was finally followed, which involved giving the judges the pre-established criteria, did indeed reach high agreement, but ignored valuable information that would give insight to a substantial number of CD children's emotion understanding blended with emotional experience and the variety of factors implicated in it. Nonetheless, the qualitative analysis of certain patterns that emerged in CD children's answers had gone some way to 'complement' the coding scheme. This qualitative analysis has given some preliminary insight to the nature of CD children's emotion understanding (and experience) and strongly indicates the necessity for further clarification of emerging patterns.

A third methodological problem applies to the tasks used to assess affective (as well as cognitive) perspective-taking. Children's response to 'why' questions (used in the perspective-taking tasks) appeared problematic. It is likely that the children did not have a ready reason to justify their answer but they made up one when they were asked. It might be that differences observed between typically-developing and CD groups are, to a certain degree, a function of the relatively lower ability of the CD children to justify their answers or to make up a conventional explanation for their attributed emotion.

A fourth methodological issue, that applies specifically to the assessment of affective perspective-taking, is the extent of generalisability of the findings. The range of emotions tested was wide (sadness, fear, anger, happiness, embarrassment, sympathy, guilt, shame) but not exhaustive. Therefore, results should not be considered as generalisable across emotions that were not tested. It is plausible, for instance, that CD children have difficulty with specific emotions. In fact, both CD groups have shown problems particularly associated with moral emotions. Whether

their difficulties are specific to moral emotions, or apply to other emotions that were not tested is not known. In addition, emotion understanding was not assessed across a wide range of situations. Most stimuli that were used were designed to evaluate prosocial and antisocial behaviour in children within the school setting. Therefore, results may be limited to specific situations. It might be, for instance, that a substantial number of CD children show difficulty in understanding the emotions or the perspectives of individuals who act prosocially but not those who act antisocially. This interpretation was supported by patterns observed in the qualitative data, in which a substantial number of CD children demonstrated greater ability to reason about antisocial behaviour relative to their 'typically-developing' counterparts but a diminished ability to reason about prosocial behaviour. Consequently, for a substantial number of CD children, it might be that their difficulties in failing to take others' perspectives apply only when these others behave in a socially desirable way and may not generalise to other situations. It therefore remains to be explored whether the present findings can be replicated across a variety of situations. More importantly, it still remains to be explored whether present findings, in terms of both affective and cognitive perspective-taking, will resist tests of ecological validity. It may be that CD/CU children do not fail to understand others' cognitive perspective in the context of a simple (or even relatively complex task). But, in ambiguous real life situations, the interplay of various interactive dispositional and situational factors might make them fail to take another's perspective. Crick and Dodge (see Crick & Dodge, 1994), for instance, have reported that it is in ambiguous situations that CD children attribute hostile intent to others.

Aside from the limitations in the affective and cognitive perspective-taking measures, there also some problems inherent in the rating scales in general. These problems apply to the scales used in the current investigation to identify (i.e. conduct difficulties Rutter subscale), classify (i.e. CU subscale of the PSD) CD subgroups and compare these subgroups on other difficulties (i.e. impulsivity and narcissism subscales of the PSD). Five of the problems inherent in the rating scales (previously presented in greater detail in section 3.5.4.) require particular caution. Firstly, informants could only report behaviour that they had the chance to observe, or it was recorded in the children's files. Therefore, they may not be aware of children's

covert antisocial acts or, most importantly, of their feelings that might have been kept private especially in the disturbed population of EBD children. This weakness is particularly troublesome in the present study, given the reliance on reports from informants within a single setting (i.e. children's school), whereas it is typically recommended that researchers use multiple informants in different settings to assess childhood psychopathology (Kamphaus & Frick 1996; Hogg *et al.,* 1997). Secondly, some behaviours are context specific (Hogg *et al.,* 1997). Some, such as oppositional-defiant behaviour, reflect not only a child's characteristics but also relational qualities. Others, such as hyperactivity, are affected by the degree of structure in the situations. Thirdly, the informants were required to judge the degree to which children manifested the sets of behaviour traits or difficulties. In effect, informants' judgement would necessarily be based on the comparison between the children within the particular setting rather than across the entire sample. Fourthly, the ratings scales are likely to be affected by the informant's 'mental state' (Hogg *et al.,* 1997). For instance, anxious individuals may be more sensitive to children's anxieties. Lastly, ratings are often made on the basis of some general impression of the child (Aman, 1993). This may have consequently resulted in diminished accuracy in the report of the specific symptomatology (i.e. impulsivity, narcissism, CU traits), and a tendency to rate a particular child high or low the on all the scales based around the general impression formed for the child.

Apart from these problems inherent in rating scales, an additional measurement issue applies to the measure of verbal skills used. The measure of receptive vocabulary used in the present investigation is limited in giving a comprehensive idea of the child's verbal ability in a more general sense. For instance, nothing is known about the participating children's verbal reasoning. It might be that certain children do not present specific difficulties in expressive language but show deficits in verbal reasoning. Verbal intelligence is perhaps more likely to be implicated in a child's perspective-taking ability, rather than a child's generic vocabulary skill.

In addition to these measurement issues, the results are likely to be a function of CD/cu children's lower verbal skills as indicated by the measure of receptive vocabulary. Therefore, not matching the groups in terms of verbal skills or not

statistically controlling for verbal skills might be considered a shortcoming of the present study. However, given that verbal skills deficits characterise a substantial number of CD children, recruiting a CD/cu group matched in terms of verbal abilities with the controls would be practically difficult within the time limits and resources available to the current project. In addition, in our view it is debatable whether it is appropriate to make a pre-selection or to statistically eliminate the effect of differences in verbal skills on perspective-taking differences between 'naturally' occurring groups, in which verbal skills deficits seem to be an integrated characteristic.

The results might further merely be a function of emotion literacy. Not accounting for the effects of emotion literacy was a limitation of this study. Perhaps CD children, due to socialisation histories, had difficulty describing (rather than understanding) with accuracy how someone in a particular situation feels. Emotion literacy is interesting in its own right in this population. The words that these children used to describe others' emotions were interesting and this warrants further investigation. Nonetheless, it is again debatable how one could disentangle emotion literacy effects from emotion understanding and emotional experience.

A further factor that might have had an impact on the results obtained is the attention deficit characterising a substantial number of CD children. To deal with attention deficit effects, in the procedure of the current study, repetition was provided when required and the time period of each session was small. The finding that CD/CU children did not show deficits in cognitive perspective taking might be considered as an indirect indication that this procedure might have helped to limit attention deficit effects. Nonetheless, it is conceivable that difference between average 'normally' developing and CD subgroups could to some extent be due to attention deficits in CD children. It is however unlikely that differences across CD subgroups are due to attention deficit effects, as the two subgroups did not differ from each other with respect to attention deficit symptomatology.

Of further potential concern is the sample bias inherent in the subject selection procedures. As the total population of the CD children were recruited from EBD schools, it might be that the sample is not representative of the general population of

the CD children. Similarly, the sample of comparison children was drawn from a single school and in a particularly deprived area, which may have also had an effect on the results.

An additional methodological limitation of the current investigation is the large age range of the CD samples and the difference between the age range in CD samples and in comparison controls. The large age range of the current CD samples is problematic in its own right. Changes in cognition across the stages of development are considerable. If, above this, the large age range in the CD samples (3.2 years) is considered together with the smaller range in the controls (2 years) then it is conceivable that it may have masked developmental differences (or lack of difference) in different stages of development across groups. It may be, for instance, that groups do not differ at the age of 7.5 but they differ at the age of 10. However, although the large age range in the CD samples might have masked developmental changes within group or across CD groups and 'typically-developing' controls at different stages of age, it is unlikely that the differences observed between the CD subgroups are an artefact of the age range, as both CD groups had the same age range.

Of further prospective concern in the current investigation is the imbalanced representation of the two genders across the three groups. One might argue that given that the CD groups consisted predominantly of males while the control group consisted of 34 boys and 18 girls it might be that the differences observed between CD subgroups and 'typically-developing' controls are a function of gender differences. Gender differences are generally not noted in cognitive perspective-taking (Chandler *et al.*, 1974; Kurdek & Rodgon, 1975; Selman, 1971; Warden *et al.*, in preparation). But data are not unanimous. In some investigations sex differences have been found in relationships between behaviour and social cognition (Silvern 1976, as cited in Waterman *et al.*, 1981; Burka & Glenwick, 1978). Nonetheless, in the present investigation when the sample of control girls was excluded from the analysis, the differences still persisted. Therefore, it seems that the results of the present investigation are not an artefact of gender effects.

A further issue related to gender is that given that both CD groups consisted predominantly of boys the findings should not be considered as generalisable to CD girls.

4.5.5. Conclusion

In conclusion, present preliminary data provide evidence of dissociation between affective and cognitive perspective-taking in CD/CU children. In addition, if present preliminary quantitative data, further substantiated by qualitative information, are replicated, it seems that a significant number of CD children may present a distortion in affective perspective-taking rather than a deficit. This distortion, which seems to be of a varied nature, may be implicated in their misconduct. But the link between affective perspective-taking (given its interaction with the diverse nature of emotional experience, and the factors implicated in it) and persistent conduct problems) may be much more complex than initially might have been thought.

Chapter 5: General Discussion

5.1. Overview

In this concluding chapter, four interrelated themes are addressed. Section 5.2 integrates the findings of studies 2 and 3, which are suggestive of dissociation between the affective and cognitive dimensions of empathy in the two examined subgroups of CD children (i.e. CD/CU, CD/cu). Section 5.3. discusses the differing affect-related deficits evident across CD/CU and CD/cu children. Section 5.4. discusses the evidence to support distinct deficits in the developmental pathway of empathy across the two CD subgroups. Section 5.5 discusses the limitation of both affective and cognitive dimensions of empathy as an explanation for antisocial conduct in either CD/CU or CD/cu children, and suggests that more comprehensive models are needed to explain the failure of CD children to inhibit their antisocial conduct. Finally, section 5.6. discusses the implication of the findings of the studies reported in this thesis for the measurement of affective empathy.

5.2. Preliminary evidence of dissociation between affective and cognitive dimensions of empathy in CD children

The results of studies 2 and 3, taken together, provide some preliminary evidence of dissociation between affective and cognitive dimensions of empathy, in subgroups of CD children. These results seem to suggest that there might be a differentiated operation of the affective (vicarious affective arousal), 'purely cognitive' (cognitive perspective-taking) and cognitive/affective (affective perspective-taking) dimensions of empathy in CD subgroups.

CD/CU children, on one hand, who have shown the most serious patterns of antisocial conduct (as indicated in the conduct difficulties Rutter subscale), have shown a specific affect related deficit. These deficits have been illustrated in vicarious affective arousal, and in affective perspective-taking across the low and high level cognitive skills tasks, but not in cognitive perspective-taking in the high level cognitive task. A task in which importantly, in the current methodology, affective and cognitive perspective-taking were interrelated, and consequently it

cannot be argued, for instance, that the cognitive components of the affective perspective-taking was of different order of difficulty.

CD/cu children, on the other hand, who have demonstrated relatively milder patterns of antisocial conduct have not shown evidence of deficits in the direct indices of vicarious affective arousal. As study 3 revealed, however, CD/cu children do present deficits in both cognitive and affective perspective-taking.

In order to substantiate the findings of vicarious affective arousal deficits in CD/CU children, the present preliminary findings need to be replicated in a series of situations. Assessment of vicarious affective arousal was situational and in a laboratory setting in the present study. It remains to be seen whether these results can be replicated across a number of situations and with the use of other stimuli. More importantly, it still remains to be explored whether these results demonstrate ecological validity. Studies using physiological measurements in naturalistic settings are difficult to implement, but still plausible as HR can be accurately and validly measured using non-invasive pulse meters (Treiber *et al*, 1989).

In the same way, the apparent absence of cognitive perspective-taking deficits in CD/CU children needs to be substantiated. Present results need be replicated with the use of tasks varying in cognitive complexity. Different methods of assessment of perspective-taking should be used, possibly including newly developed methodologies involving perspective simulation and PET (Positron Emission Tomography; Ruby & Decety, 2001). Most importantly, the lack of deficits in cognitive perspective-taking in CD/CU children needs to stand up to tests of ecological validity. One might argue, for instance, that CD/CU children may not fail to understand others' cognitive perspective in the context of a simple (or even relatively complex task). But, in ambiguous real life situations, the interplay of various interactive dispositional and situational factors might make them fail to take another's perspective. Happé and Frith (1996), for instance, have reported that CD children did not fail to understand others' cognitive perspectives in a series of simple situations but showed impairments of social insights in real life behaviour. As Happé and Frith (op cit) argue, it might be that it is the online ability to infer mental states that might be 'faulty' in CD children.

206

If present results on both perspective-taking and vicarious affective arousal are replicated, then the claim of dissociation of affective and cognitive empathy in CD subgroups will be more grounded. In addition, to broaden the argument of such dissociation, further evidence of dissociation between affective and cognitive dimensions of empathy may possibly be found in other child clinical populations, for instance, in children with autism who are well documented to show perspective-taking deficits (see Frith & Happé, 1999). It is often assumed that children with autism have a complete lack of capacity for affective empathy. However, to our knowledge, there are no available data on tests of this capacity using direct indices of vicarious affective arousal in autistic children. Therefore, one might argue that these children might show vicarious affective arousal in response to another's affective state irrespectively of their deficits in affective and cognitive perspective- taking. If this proves to be the case, then such a finding would provide some further evidence of dissociation between affective and cognitive dimensions of empathy.

5.3. Different affect-related deficits across CD subgroups

Present studies have shown affect-related deficits in both CD groups. Importantly however, if present data are replicated, it seems that CD subgroups show different affect-related deficits. CD/CU children, on one hand, have shown deficits in vicarious affective arousal and deficits/distortions in affective perspective-taking across the low and high level cognitive skills tasks. In other research, they have shown a lack of fearful inhibition and other deficits in the processing of emotional stimuli (Frick et al., 1994b; O' Brien & Frick, 1996). Further, neurophysiological data have suggested a deficit in the neurophysiological systems modulating fear, mainly in the adult psychopath, but also in the child who shows traits characterised as CU or psychopathic (see Trasler, 1978; Gray, 1987; Fowles, 1988; Patrick, 1994) The underidentification of fear found in study 3 may also be indicative of low fearfulness in this group but this claim is speculative.

On the other hand, CD/cu children, although they did not show deficits in vicarious arousal, did show deficits/distortions in affective perspective-taking. Importantly, this deficit could not simply be explained by their cognitive deficit, as they also

showed affective perspective-taking deficits in a task that required limited cognitive skills. This indicates that CD/cu children do present affect-related deficits as well. But patterns of present data seem to indicate that their affect deficit is of a different nature to that of CD/CU children. Present preliminary data provide indirect support for low emotional regulation of intense negative emotions in CD/cu children. These children, in study 3, showed a clear tendency to overidentify anger to others. Many of them also showed a clear tendency to overidentify more intense negative emotions (e.g. devastated, miserable, panicked, shameful, disgraceful) some of which emotions were substantiated by justifications revealing difficulty in regulating these intense negative emotions. These data can be taken as support of the Eisenberg and Fabes (1992) claim that reactive aggression, which is the most prevalent form of aggression exhibited by CD/cu children (Cornell et al., 1996), is a product of more intense negative intensity and under-regulation. In fact, Dodge and Coie (1987, p.1156) describe reactive aggression as 'angry aggression'.

Individual differences in the intensity of children's anger reactions have been associated with the degree to which these reactions are constructive (Eisenberg et al., 1994b). It has been shown that individuals who are highly emotional in response to anger-inducing events, and low in regulation, are likely to show aggression (Eisenberg et al., 1993, 1994a; Fabes & Eisenberg, 1992). Eisenberg and colleagues hypothesise that intensity of anger is related to a loss of behavioural control. Children who fail to employ such strategies as attentional control, avoidance, and instrumental coping to vent their emotions are believed to react aggressively (Eisenberg et al., 1993; 1994b).

Low emotional regulation, which is underlined by low physiological regulation, has in general been consistently linked to externalising psychopathologies, even at an early age (e.g. Porges, Doussard-Roosevelt, Portales & Greenspan 1996; Calkins & Dedmon, 2000). Given that physiological regulation refers to processes that serve to manage arousal (Calkins, 1994) and that, in study 2, CD/cu children have shown higher levels of arousal in comparison with CD/CU children, it might be that their lack of behaviour control is highly related to their inability to regulate this arousal. It might be, for instance, that inability to regulate arousal interferes with the accuracy

of perception in arousing situations, especially when these situations are ambiguous. Indeed, Crick & Dodge (1996) have found that reactively aggressive children misinterpret others' intentions in ambiguous situations.

However, in order for the claim of low physiological regulation in CD/CU children to be substantiated, direct measures of physiological regulation need to be obtained. Measures of physiological regulation have not been employed in the present investigation. In addition, the over attribution of anger is only indirect evidence for low emotion regulation in this group. Future studies need to employ direct measures of physiological regulation (such as Heart Rate Variability) in order to determine if affect deficit in this group is marked by low physiological regulation.

5.4. Different deficits in the developmental pathway of empathy, n CD subgroups

Hoffman (1984; see section 2.3), in his influential developmental model of empathy which found support from other empathy theorists (see Zahn-Waxler & Kochanska 1988 for a review), posits the emergence of empathy and other social emotions as prerequisites for moral behaviour (e.g. Hoffman, 1984; for a review see Zahn-Waxler & Kochanska, 1988). He proposes a series of stages through which individuals progress from the very first moments in their life until they act intentionally in a moral manner. Any deficiency within these stages would be expected to have negative consequences for their moral functioning.

The different patterns of deficits in the two CD subgroups may lead them to follow different (and deviant) developmental pathways in the acquisition of empathy-motivated moral functioning. There is evidence to suggest that CD/CU children show deficiencies in most of the stages through which empathy-motivated moral conduct is built. Starting from the very first stage, Hoffman (op cit) suggests that even very young children are in a sense biologically prepared with the capacity for empathy, in that they selectively attend to emotions - especially distress - in others. Empirical data support the early origins of this capacity (Zahn-Waxler & Radke-Yarrow, 1982; Radke-Yarrow & Zahn-Waxler, 1986). Individuals with a hypoaroused nervous system show diminished sensitivity to the emotional expression of other individuals

(Eliasz & Reykowski, 1986; Eysenck, 1967, as cited in Paterson & Newman, 1993). Hoffman (op cit) postulates that the observation of distress in others triggers an innate vicarious arousal in the child, even before the child has the cognitive capacity to differentiate 'other' from 'self'. Study 2 has shown that CD/CU children, at a much older age (i.e. 7.6-10.8), when observing distress in others, show deficits in the triggering of this vicarious arousal. Was it the case, though, that these children were born with this deficiency? Until longitudinal data are available and a bidirectional relationship is established, this claim remains tentative. One might also argue that, although unlikely, the reverse causal sequence is possible. For instance, that autonomic hypoarousal and/or reduced vicarious arousal may develop as a function of early problematic behaviour rather than being a cause of this behaviour. Alternatively, one might argue that both a deficiency in the capacity to get vicariously aroused and the behaviours characterising CD/CU evolve from similar or different sources, and develop contemporaneously.

At the next stage of Hoffman's developmental model of empathy, the range of cues and stimuli that would trigger vicarious arousal increase through both classical and operant conditioning as the child gets older. Empirical data have shown that samples of CD children, characterised as CU, psychopathic, or undersocialised, or more generally individuals with a hypoaroused nervous system, are less responsive to the levels and types of stimuli that are normally used for reinforcement and punishment (Eliasz, 1987). As a result, they are handicapped in learning through autonomic conditioning, although they exhibit no general intellectual deficit (e.g. Hare & Quinn, 1971; Eysenck, 1977; Mednick, 1977; Ziskind, Syndulko & Maltzman, 1978; Gorenstein & Newman, 1980; Newman, Widom & Nathan, 1985; Raine, 1988; Lytton, 1990; Zuckerman, 1991; Raine, Venables & Williams, 1990; Newman *et al.*, 1992; Paterson & Newman, 1993; Raine, 1993). Consequently, it might be argued that CD/CU children, with diminished ability to experience vicarious arousal and to form conditioned associations between antisocial behaviour and its consequences, might be unable to progress through the normal stages of empathy-motivated moral conduct. These children, as the data of study 3 have shown, do not seem to present any deficits in the ability to take another's cognitive perspective. However, their diminished ability to experience vicarious arousal will not provide an adequate basis

for conversion to sympathy which, according to Hoffman's model, would motivate intentional prosocial conduct and inhibit antisocial conduct. An analogous deficit (i.e. to experience vicarious affective arousal) has been proposed in the case of proactive aggression (see Eisenberg & Fabes 1992; Arsenio & Lemerise, 2001). This form of aggression has been claimed to mostly exhibited by CD/CU children (Cornell *et al.* 1996). Eisenberg and Fabes (1992) support the claim that proactively aggressive children are insufficiently aroused to become sympathetic. However, as discussed above, the claim that CD/CU children do not show deficits in perspective-taking needs to be further corroborated for more definitive conclusions to be drawn.

CD/cu children, on the other hand, exhibit deficits at different stages of Hoffman's (1984) developmental model of empathy. These CD children do not seem to have presented deficits in the early levels of empathic responsiveness which are considered to be primarily involuntary. This assumption is based on the finding of study 2 that, at the examined stage of age (7.6-10.8), the observation of distress in others does trigger an innate vicarious arousal in CD/cu children. However, this finding needs explicit longitudinal validation. What has not been adequately taken into consideration by Hoffman's model is that homogeneity of cognitive awareness and interpretation of vicarious arousal should not be inferred. For instance, data from study 2 and indirectly from study 3 suggests that the arousal experienced by CD/cu children would not always convert to sympathy, and in turn motivate intentional moral conduct. In some children, arousal may turn to anger (perhaps related to non-inductive discipline), or fail to be attributed to the victim's affective state. In other children, a victim's affective state may not be perceived to be induced by the perpetrators' acts (perhaps by means of diffusion of responsibility). In other CD/cu children it seems that there might not be conscious awareness of their vicarious affective arousal. The conscious awareness/cognitive interpretation of vicarious arousal seems to mediate the relation between vicarious arousal and antisocial conduct. It therefore needs to be addressed in greater detail by future investigations. Such investigations could prove to have critical implication in intervention programs. If it is substantiated that for some CD children all that is missing is their conscious awareness or correct interpretation of their own vicarious arousal then specific affective perspective-taking intervention programs might prove to be of substantial

assistance for such children. Study 3 has shown a deficit in CD/cu children at the next, final stage of Hoffman's model, when the child is expected to develop the cognitive ability to take on another's perspective, facilitating the conversion of vicarious arousal into sympathy and thereby motivating intentional moral conduct and inhibiting immoral conduct. Consequently, a significant number of CD/cu children (partly due to deficits in cognitive perspective-taking, deficits and/or diverse distortions in affective perspective-taking) might have remained handicapped in the initial modes of empathic responsiveness and at an immature stage of moral development. Vicarious arousal might have never turned to sympathy which would enable them to act intentionally in a moral manner.

5.5. Deficits in empathy are inadequate to explain the failure to inhibit antisocial conduct in CD children. Towards a two component interactive model

The results of studies 2 and 3 suggest that deficits in vicarious arousal and deficits/distortions in affective perspective-taking can account, to a certain degree, for the failure to inhibit antisocial conduct in CD/CU children. These results further indicate that a reduced capacity for affective perspective-taking, and for vicarious arousal, without any accompanying deficit in cognitive perspective-taking, underlines more serious patterns of antisocial conduct. This assumption is based on the finding that CD/CU children have shown more serious patterns of antisocial conduct relative to their CD/cu counterparts. However, it should be noted that the present results are cross-sectional, so conclusions remain tentative.

It may further be argued that, for the CD/CU children, a predominant weakness is possibly their deficit in vicarious arousal, and that deficits in affective perspective-taking might have resulted from deficits in vicarious arousal. This assumption is based on the indirect findings that: **i)** deficits in affective perspective-taking in CD/cu children did not coincide with deficits in vicarious affective arousal, and; **ii)** CD/CU children did not show deficits in cognitive perspective-taking, which is the second substantial determinant of affective perspective-taking. Nonetheless, it still remains to be tested directly whether deficits in affective perspective-taking have resulted from deficits in vicarious affective arousal in CD/CU children.

212

This is not to say that deficits in the capacity for vicarious affective arousal alone explain the patterns of behaviour in CD/CU children, for two important reasons. Firstly, CD/cu children did not present such deficits and still failed to inhibit antisocial conduct. Secondly, reduced vicarious affective arousal is not restricted to CD/CU children. Significant variations exist in normative samples and have not resulted in antisocial conduct. There is evidence that many children who show relative deficits in vicarious affective arousal may still be well socialised (Kochanska, 1991).

As for CD/cu children, the results of study 2 and 3 suggest that deficits in cognitive- and deficits/distortions in affective-perspective taking can account to a certain degree for their failure to inhibit antisocial conduct. It may further be argued that, for CD/cu children, the predominant weakness may be a deficit in cognitive perspective-taking, and that deficits in affective perspective taking are, to a significant extent, due to cognitive perspective-taking deficits. It is even plausible that, in CD/cu children, deficits/distortions in affective perspective-taking may preclude vicarious affective responses. For instance, it might be that they show reactive aggression as a result of inappropriate interpretation of others' behaviour or affective state in emotionally arousing situations. Indeed, studies have shown that reactive aggression is a correlate of inappropriate interpretation of another's behaviour (hostile attribution bias; e.g. Crick & Dodge, 1996). To the extent that individuals' cognitions influence their vicarious affective responses towards others, their misperception of the situation may preclude inhibition of antisocial conduct without necessarily implying any lack of capacity for empathy.

Of course, once again, it does not mean that that perspective-taking deficits are solely responsible for a failure to inhibit antisocial conduct in CD/cu children. The speculation (e.g. Hare, 1970) that antisocial conduct is the result of a deficiency in perspective-taking seems to be an oversimplification for two reasons. Firstly, in study 3, CD/CU children have not shown deficits in cognitive perspective-taking but are still involved in persistent patterns of antisocial conduct. Perspective-taking competency has been reported for other child samples involved in antisocial conduct drawn from normative samples (e.g. Sutton *et al.*, 1999a; Sutton *et al.*, 2000).

Secondly, perspective-taking deficits can be found in other clinical child and adolescent samples (e.g. Pervasive Developmental Disorder-PDD, Non-verbal Learning Disorder-NLD, Hyperlexia; see Winner, 2002) and these deficits have not resulted in antisocial conduct of clinical significance.

The relative competency of CD/CU children in cognitive perspective-taking on the one hand, and of CD/cu children in vicarious affective arousal on the other, necessitate acknowledging the limitation of using cognitive and/or affective empathy deficits as an explanation of failure to inhibit antisocial conduct. It is therefore necessary to consider other, more comprehensive models.

One such model of development of moral conduct has been put forward by Kochanska (1993). This theoretical framework integrates two research perspectives: on parent socialisation and on individual temperamental differences. This model has been proposed to consist of two interactive components that contribute to moral conduct: **i)** a child's 'affective discomfort', and; **ii)** the capacity for 'behavioural control' when standards of conduct apply. Each of these components is proposed to encompass specific temperamental underpinnings (that may account for individual differences among children and that may moderate the effects of parental socialisation) and developmental processes in which parental socialisation is involved. The 'affective discomfort' component (Kochanska, 1993, p.325) is proposed to consist of the experience of 'affective discomfort', affective arousal, emotions of guilt or remorse occasioned by a committed or anticipated transgression, and the developmental processes during which these feelings emerge and progressively become more differentiated. The 'affective discomfort' component of Kochanska's model can be seen as analogous to Hoffman's model of inhibition of immoral conduct by means of vicarious affective arousal discussed earlier. The 'affective discomfort' might be seen as corresponding to 'vicarious affective arousal'. But in contrast to Hoffman's model, 'affective discomfort' is embedded in a more comprehensive interactive model.

The second component of Kochanska's model, 'behavioural control' has been proposed to encompass multiple processes. These processes include: **i)** a desire to inhibit a prohibited behaviour; **ii)** a learned inhibitory skill; **iii)** an effective use of

verbal and attentional self-regulatory skills; **iv)** a recollection of the caregiver's preaching, and ; **v)** a decision process involving a cost-benefit analysis (Kochanska, 1993). In these processes, the contribution of the first component ('i.e. 'affective discomfort') of moral conduct and the interaction of the two components is critical (Kochanska, 1993). For these behavioural control processes to be activated, and behaviour inhibition to be achieved, a variety of developing systems are considered to be implicated. For instance, the development of cognitive functions such as attention, memory and language have been considered to be of particular importance (see Kochanska, 1993). Rothbart (1989) stressed the importance of attentional processes, while Emde, Biringen, Clyman, & Oppenheim (1991) emphasised the importance of representational thought in enabling the developing child to 'keep in mind' rules and expectations regarding appropriate conduct. Kopp (1982) drew attention to the importance of recall memory for the child's continual awareness of appropriate actions and strategies of coping. Other investigators have emphasised the importance of verbal controls in enabling the child to inhibit a prohibited behaviour (e.g. Luria, 1961; Kopp, 1982; Maccoby, 1980; Mischel & Patterson, 1976; Vaughn, Kopp & Krakow, 1984; Pulkkinen, 1986; Reed, Pien & Rothbart, 1984; Rothbart, 1989).

Consequently, where there are developmental deficits in any of the components of Kochanska 's model, or in any developmental process involved in it, these may be implicated in CD children's diminished capacity for behavioural control. A substantial number of empirical investigations have documented deficits in the 'affective discomfort' component in samples of CD children. For instance, samples of CD children characterised as undersocialised/aggressive psychopathic or CU have shown low levels of arousability (e.g. Raine *et al.,* 1990a; Schmidt *et al.,* 1985; Lahey *et al.,* 1993). Similarly, deficits in 'affective discomfort' when observing someone in distress can be seen in the results of study 2 reported here for CD/CU children.

The processes involved in the capacity for the 'behavioural control' component of Kochanska's model have received much less attention by investigators. Scarce empirical investigations have found deficits in processes implicated in the capacity

for behavioural control. For instance, several investigators have reported verbal deficits in samples of CD children (see Moffit, 1993a). Other investigators have found deficits in attentional processes in samples of CD children (see Raine, 1996). However, studies examining isolated factors in a cross-sectional fashion are not adequate for an empirical testing of Kochanska's model.

The interaction of the two components proposed by Kochanska's model, the developmental processes involved, and the effect of parental socialisation in both components have not been yet been adequately addressed by empirical investigations. For an efficient empirical testing of this model, multiple measures on the 'affective discomfort' component, the capacity for 'behavioural control' component (and the multiple processes encompassed), and on parental socialisation practices need to be employed. The interactions of these factors would need to be followed from the very early stages of the child's life and across his/her development. If such measures were developed and used longitudinally, then our understanding of how diverse factors interact with each other in the development of CD would be considerably advanced. For example, how do individual differences in 'affective discomfort' interact with varied socialisation practices in the development or prevention of CD? How can individual difference in 'affective discomfort' facilitate or disrupt the role of socialisation agents for the development of behaviour control? Or, how would differing socialisation practices disrupt/inhibit the facilitating role of 'affective discomfort' in the behaviour control? Or, how would deficits in the processes involved in the 'behaviour control' component extinguish the facilitating effect of the 'affective discomfort' in the development of effortful moral conduct.

5.6. Implications of findings on the measurement of affective empathy

The findings of the studies reported here, if replicated, have important implications for the measurement of affective empathy in children. Present findings raise concerns over the validity of the current verbal measures (i.e. self-report questionnaires and self-reports of emotional state) of affective empathy in both the 'typically developing' and also CD children, at least in the examined age range (7.6-10.8

years). In addition, present findings suggest that, if the existing verbal measures are used for group comparison purposes, they are likely to underestimate the vicarious affective responsiveness of groups of children that are more vulnerable to the pitfalls of self-reports for instance children with deficits in verbal and introspective skills. At the same time, verbal measures may overestimate vicarious responsiveness in children who are vulnerable to the need for social desirability.

But some evidence from verbal reports of vicarious affective responsiveness in study 2 and indirect evidence from the affective perspective-taking tasks in study 3 seems to indicate that autonomic indices may not be enough if we are interested in more than vicarious arousal per se. Autonomic indices represent nothing more than physiological reactions to stimuli. Their validity is based on operationalising affective empathy as strictly vicarious affective arousal. In research which focuses upon cognitive awareness or interpretation of the arousal, these measures are less helpful. As indicated by the data of studies 1 and 2, and indirectly of study 3, reported here indicate, the presence of physiological arousal does not imply either the socially expected interpretation or even awareness of that arousal.

Among the existing measures, however, physiological indices do provide the most valid information as to whether affect is aroused in the observer. Consequently, they could be used as a basis for validating newly developed methodologies. One new methodology that seems to be promising is a computer based automatic facial expression analyser (see Pantic & Rothkrantz, 2000). This methodology offsets the problems inherent in the subjective coding of the facial expressions. It can detect even subvisible changes in the facial action muscle movements, which, so far, was impossible to detect by previous facial expression coding systems. This new methodology is still in its initial stages of development but, if successful, might indeed prove a useful tool for empathy research. This measure, by overcoming the problems inherent in the subjective coding, and being able to detect even subvisible changes in facial muscles movements, might indeed show high agreement with autonomic indices of arousal. Thus, it may provide an alternative tool for the measurement of affective empathy.

5.7. Conclusion

Though cognitive and affective dimensions of empathy may promote prosocial and inhibit antisocial conduct, it does not seem that any of these dimensions of empathy play a guaranteed role in inhibiting persistent and serious patterns of antisocial conduct. CD/CU children showed deficits in the affective dimensions of empathy but not in the purely cognitive dimensions of empathy (i.e. cognitive perspective-taking) and also were found to exhibit more serious patterns of antisocial conduct. This suggests that affective empathy might play a relatively more important role in the inhibition of antisocial conduct. However, the lack of a deficit in affective empathy in CD/cu children indicates that affective empathy is not all that is needed for the inhibition of antisocial conduct.

Consequently, present findings indicate the limitation of empathy deficit models in explaining immoral conduct. Present data provide evidence in support of more comprehensive, interactive models which accept the importance of experience of vicarious arousal associated with an immoral act, but acknowledges that it may not be sufficient for moral conduct. They stress the equal importance of the development of a child's effortful capacity for behavioural control, the multiple developmental processes implicated in it and the interaction with socialisation practices that will restrain him/her from committing a moral transgression. Using multiple measures of all these factors from a very early stage and across the child's development would enhance our understanding of the complex interplay between diverse temperamental vulnerabilities and diverse social factors resulting in the development CD through diverse developmental trajectories.

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242

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Appendices

Appendix 1

European Description of Conduct Disorder

F91 Conduct Disorders

Conduct disorders are characterized by a repetitive and persistent pattern of dissocial, aggressive, or defiant conduct. Such behaviour, when at its most extreme for the individual, should amount to major violations of age-appropriate social expectations, and is therefore more severe than ordinary childish mischief or adolescent rebelliousness. Isolated dissocial or criminal acts are not in themselves grounds for the diagnosis, which implies an enduring pattern of behaviour.

Features of conduct disorder can also be symptomatic of other psychiatric conditions, in which case the underlying diagnosis should be coded.

Disorders of conduct may in some cases proceed to dissocial personality disorder (F60.2). Conduct disorder is frequently associated with adverse psychosocial environments, including unsatisfactory family relationships and failure at school, and is more commonly noted in boys. Its distinction from emotional disorder is well validated; its separation from hyperactivity is less clear and there is often overlap.

Diagnostic Guidelines

Judgements concerning the presence of conduct disorder should take into account the child's developmental level. Temper tantrums, for example, are a normal part of a 3-year-old's development and their mere presence would not be grounds for diagnosis. Equally, the violation of other people's civic rights (as by violent crime) is not within the capacity of most 7-year-olds and so is not a necessary diagnostic criterion for that age group.

Examples of the behaviours on which the diagnosis is based include the following: excessive levels of fighting or bullying; cruelty to animals or other people; severe destructiveness to property; fire setting; stealing; repeated lying; truancy from school and running away from home; unusually frequent and severe temper tantrums; defiant provocative behaviour; and persistent severe disobedience. Any one of these categories, if marked, is sufficient for the diagnosis, but isolated dissocial acts are not.

Exclusion criteria include uncommon but serious underlying conditions such as schizophrenia, mania, pervasive developmental disorder, hyperkinetic disorder, and depression.

This diagnosis is not recommended unless the duration of the behaviour described above has been 6 months or longer.

Differential diagnosis. Conduct disorder overlaps with other conditions. The coexistence of emotional disorders of childhood (F93. -) should lead to a diagnosis of mixed disorder of conduct and emotions (F92.-). If a case also meets the criteria for hyperkinetic disorder (F90.-), that condition should be diagnosed instead. However, milder or more situation-specific levels of overactivity and inattentiveness are common in children with conduct disorder, as are low self-esteem and minor emotional upsets; neither excludes the diagnosis.

Excludes:
* conduct disorders associated with emotional (F92.-) or hyperkinetic (F90.-) disorders

* mood [affective] disorders (F30-F39)
* pervasive developmental disorders (F84.-)
* schizophrenia (F20.-)

F91.0 Conduct Disorder Confined To The Family Context

This category comprises conduct disorders involving dissocial or aggressive behaviour (and not merely oppositional, defiant, disruptive behaviour) in which the abnormal behaviour is entirely, or almost entirely, confined to the home and/or to interactions with members of the nuclear family or immediate household. The disorder requires that the overall criteria for F91 be met; even severely disturbed parent-child relationships are not of themselves sufficient for diagnosis. There may be stealing from the home, often specifically focused on the money or possessions of one or two particular individuals. This may be accompanied by deliberately destructive behaviour, again often focused on specific family members—such as breaking of toys or ornaments, tearing of clothes, carving on furniture, or destruction of prized possessions. Violence against family members (but not others) and deliberate fire-setting confined to the home are also grounds for the diagnosis.

Diagnostic Guidelines

Diagnosis requires that there be no significant conduct disturbance outside the family setting and that the child's social relationships outside the family be within the normal range.

In most cases these family-specific conduct disorders will have arisen in the context of some form of marked disturbance in the child's relationship with one or more members of the nuclear family. In some cases, for example, the disorder may have arisen in relation to conflict with a newly arrived step-parent. The nosological validity of this category remains uncertain, but it is possible that these highly situation-specific conduct disorders do not carry the generally poor prognosis associated with pervasive conduct disturbances.

F91.1 Unsocialized Conduct Disorder

This type of conduct disorder is characterized by the combination of persistent dissocial or aggressive behaviour (meeting the overall criteria for F91 and not merely comprising oppositional, defiant, disruptive behaviour), with a significant pervasive abnormality in the individual's relationships with other children.

Diagnostic Guidelines

The lack of effective integration into a peer group constitutes the key distinction from 'socialized' conduct disorders and this has precedence over all other differentiations. Disturbed peer relationships are evidenced chiefly by isolation from and/or rejection by or unpopularity with other children, and by a lack of close friends or of lasting empathic, reciprocal relationships with others in the same age group. Relationships with adults tend to be marked by discord, hostility, and resentment. Good relationships with adults can occur (although usually they lack a close, confiding quality) and, if present, do not rule out the diagnosis. Frequently, but not always, there is some associated emotional disturbance (but, if this is of a degree sufficient to meet the criteria of a mixed disorder, the code F92.- should be used).

Offending is characteristically (but not necessarily) solitary. Typical behaviours comprise:

bullying, excessive fighting, and (in older children) extortion or violent assault; excessive levels of disobedience, rudeness, uncooperativeness, and resistance to authority; severe temper tantrums and uncontrolled rages; destructiveness to property, fire-setting, and cruelty to animals and other children. Some isolated children, however, become involved in group offending. The nature of the offence is therefore less important in making the diagnosis than the quality of personal relationships.

The disorder is usually pervasive across situations but it may be most evident at school; specificity to situations other than the home is compatible with the diagnosis.

Includes:
* conduct disorder, solitary aggressive type
* unsocialized aggressive disorder

F91.2 Socialized Conduct Disorder

This category applies to conduct disorders involving persistent dissocial or aggressive behaviour (meeting the overall criteria for F91 and not merely comprising oppositional, defiant, disruptive behaviour) occurring in individuals who are generally well integrated into their peer group.

Diagnostic Guidelines

The key differentiating feature is the presence of adequate, lasting friendships with others of roughly the same age. Often, but not always, the peer group will consist of other youngsters involved in delinquent or dissocial activities (in which case the child's socially unacceptable conduct may well be approved by the peer group and regulated by the subculture to which it belongs). However, this is not a necessary requirement for the diagnosis: the child may form part of a nondelinquent peer group with his or her dissocial behaviour taking place outside this context. If the dissocial behaviour involves bullying in particular, there may be disturbed relationships with victims or some other children. Again, this does not invalidate the diagnosis provided that the child has some peer group to which he or she is loyal and which involves lasting friendships.

Relationships with adults in authority tend to be poor but there may be good relationships with others. Emotional disturbances are usually minimal. The conduct disturbance may or may not include the family setting but if it is confined to the home the diagnosis is excluded. Often the disorder is most evident outside the family context and specificity to the school (or other extrafamilial setting) is compatible with the diagnosis.

Includes:
* conduct disorder, group type
* group delinquency
* offences in the context of gang membership
* stealing in company with others
* truancy from school

Excludes:
* gang activity without manifest psychiatric disorder (Z03.2)

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American Description of Conduct Disorders

DSM-IV Diagnostic Criteria for Conduct Disorder

A. A repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated, as manifested by the presence of three (or more) of the following criteria in the past 12 months, with at least one criterion present in the past 6 months:

Aggression to people and animals

1. often bullies, threatens, or intimidates others
2. often initiates physical fights
3. has used a weapon that can cause serious physical harm to others (e.g., a bat, brick, broken bottle, knife, gun)
4. has been physically cruel to people
5. has been physically cruel to animals
6. has stolen while confronting a victim (e.g., mugging, purse snatching, extortion, armed robbery)
7. has forced someone into sexual activity

Destruction of property

8. has deliberately engaged in fire setting with the intention of causing serious damage
9. has deliberately destroyed others' property (other than by fire setting)

Deceitfulness or theft

10. has broken into someone else's house, building, or car
11. often lies to obtain goods or favors or to avoid obligations (i.e., 'cons' others)
12. has stolen items of nontrivial value without confronting a victim (e.g., shoplifting, but without breaking and entering; forgery)

Serious violations of rules

13. often stays out at night despite parental prohibitions, beginning before age 13 years
14. has run away from home overnight at least twice while living in parental or parental surrogate home (or once without returning for a lengthy period)
15. is often truant from school, beginning before age 13 years

B. The disturbance in behavior causes clinically significant impairment in social, academic, or occupational functioning.

C. If the individual is age 18 years or older, criteria are not met for Antisocial Personality Disorder.

Specify severity:

Mild: few if any conduct problems in excess of those required to make the diagnosis, and conduct problems cause only minor harm to others.

Moderate: number of conduct problems and effect on others intermediate between 'mild' and 'severe.'

Severe: many conduct problems in excess of those required to make the diagnosis, or conduct problems cause considerable harm to others.

DSM-IV Diagnostic Criteria for Oppositional Defiant Disorder

A. A pattern of negativistic, hostile, and defiant behavior lasting at least 6 months, during which four (or more) of the following are present:

   1. often loses temper
   2. often argues with adults
   3. often actively defies or refuses to comply with adults' requests or rules
   4. often deliberately annoys people
   5. often blames others for his or her mistakes or misbehavior
   6. is often touchy or easily annoyed by others
   7. is often angry and resentful
   8. is often spiteful or vindictive

Note: Consider a criterion met only if the behavior occurs more frequently than is typically observed in individuals of comparable age and developmental level.

B. The disturbance in behavior causes clinically significant impairment in social, academic, or occupational functioning.

C. The behaviors do not occur exclusively during the course of a Psychotic or Mood Disorder.

D. Criteria are not met for Conduct Disorder, and, if the individual is age 18 years or older, criteria are not met for Antisocial Personality Disorder.

Appendix 2

Empathy Index for Children and Adolescents (Bryant, 1982)

Statement	Empathic Response
1. It makes me sad to see a girl who can't find anyone to play with	L
2. People who kiss and hug in public are silly	NL
3. Boys who cry because they are happy are silly	NL
4. I really like to watch people open presents, even when I don't get a present myself	L
5. Seeing a boy who is crying makes me feel like crying	L
6. I get upset when I see a girl being hurt	L
7. Even when I do not know why someone is laughing, I laugh too	L
8. Sometimes I cry when I watch TV	L
9. Girls who cry because they are happy are silly	NL
10. It's hard for me to see why someone else gets upset	NL
11. I get upset when I see an animal being hurt	L
12. It makes me sad to see a boy who can't find anyone to play with	L
13. Some songs make me so sad I feel like crying	L
14. I get upset when I see a boy being hurt	L
15. Grown-ups sometimes cry even when they have nothing to be sad about	NL
16. It's silly to treat dogs and cats as though they have feelings like people	NL
17. I get mad when I see a classmate pretending to need help from the teacher all the time	NL
18. Kids who have no friends probably don't want any	NL
19. Seeing a girl who is crying makes me feel like crying	L
20. I think it is funny that some people cry during a sad movie or while reading a sad book	NL

21. I am able to eat all my cookies even when I see someone looking at me wanting one	NL
22. I don't feel upset when I see a classmate being punished by a teacher for not obeying school rules	NL

L= 'Like me' is the empathic response; NL = 'Not Like me' is the empathic response.

Appendix 3

The items of the Conduct Difficulties Revised Rutter Subscale for School-aged Children

		Does not apply	Applies somewhat	Certainly applies
1.	Often destroys or damages own or others' property	0	1	2
2.	Frequently fights or is extremely quarrelsome with other children	0	1	2
3.	Is often disobedient	0	1	2
4.	Often tells lies	0	1	2
5.	Has stolen things on one or more occasions in the past twelve months	0	1	2
6.	Bullies other children	0	1	2

Appendix 4

The items of the *Psychopathy Screening Device* (PSD; Frick and Hare in press)

	Not at all true	Sometimes true	Definitely true
1. Blames others for his/her mistakes	0	1	2
2. Engages in illegal activities	0	1	2
3. *Is concerned about how well s/he does at school/work	0	1	2
4. Acts without thinking of the consequences	0	1	2
5. His/her emotions seem shallow and not genuine	0	1	2
6. Lies easily and skilfully	0	1	2
7. *Is good at keeping promises	2	1	0
8. Brags excessively about his/her abilities, accomplishments, or possessions	0	1	2
9. Gets bored easily	0	1	2
10. Uses or 'cons' other people to get what s/he wants	0	1	2
11. Teases or makes fun of other people	0	1	2
12. * Feels bad or guilty when s/he does something wrong	2	1	0
13. Engages in risky or dangerous activities	0	1	2
14. Can be charming at times, but in ways that seem insincere or superficial	0		
15. Becomes angry when corrected	0	1	2
16. Seem to think that s/he is more important than other people	0	1	2
17. Does not plan ahead or leaves things to the 'last minute'.	0	1	2
18. * Is concerned about the feelings of others	2	1	0
19. Does not show feelings or emotions	0	1	2
20. * Keeps the same friends	2	1	0

*Denotes items inversely scored

Items 3, 7, 12,18, 19 and 20 form the Callous-Unemotional' subscale; Items 5, 8, 10, 11, 14 and 16 form the 'Narcissism' subscale; Items 1, 4, 9, 13 and 17 form the 'lack of Impulse control' subscale. The three subscales are based on a factor analysis conducted in a community sample (n=1136) of elementary school-aged children using a combination of parent and teacher ratings (Frick, Barry & Bodin, in press)

Appendix 5. Word Definitions Test of the British Ability Scales II

Word Definitions

The child has to explain the meaning of individual words.

CLUSTER SCORE	Usual Age Range:	Extended Age Range:
Verbal	6:0–17:11	5:0–5:11

? <3 failures: Continue
<3 passes: Go Back

STOP 5 consecutive failures

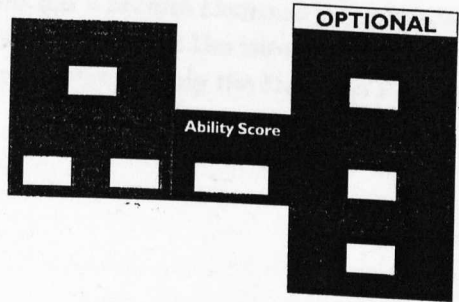Directions for using this scale can be found on page 224 of the Administration and Scoring Manual

Teaching Items

CORE SCALE

Item			Teaching Statement	Response	Score 0 – 1
5:0–7:11	1.	Scissors	Scissors are used for cutting things.		
	2.	Bed	A bed is what you lie on to sleep.		
	3.	Tiny			
8:0–10:11	4.	Travel	You travel when you go a distance to get somewhere.		
	5.	Crash	A crash is what happens when something hits something else.		
	6.	Disappear			
	7.	Twin			
	8.	Prize			
	9.	Shiver			
	10.	Invite			
	11.	Collect			
	12.	Hide			
	13.	Army			
	14.	Discover			
	15.	Plan			5:0–7:11 **?**
11:0–17:11	16.	Assistant	An assistant is someone who helps or works for someone else.		
	17.	Trade	A trade is a business or when you give something and get something back in return.		
	18.	Purpose			
	19.	Refund			
	20.	Doubt			
	21.	Error			8:0–10:11 **?**
	22.	Curiosity			
	23.	Transparent			
	24.	Victorious			8:0–10:11 **?**

2

#	Item		
25.	Consent		
26.	Unique		
27.	Deceive		
28.	Counterfeit		
29.	Tentacle		
30.	Exert		
31.	Adjacent		
32.	Pessimistic		
33.	Nomadic		
34.	Longevity		11:0–17:11 ?
35.	Ostracise		
36.	Oligarchy		
37.	Stoic		
38.	Alacrity		
39.	Recalcitrant		
40.	Misanthropy		

WORD DEFINITIONS
Raw Score to Ability Score

Raw Score	1–14	1–20	1–24	4–20	4–24	4–33	16–33	16–40
0	10(16)	10(16)	10(16)	41(15)	41(15)	41(15)	76(15)	76(15)
1	20(13)	20(13)	20(13)	49(11)	49(11)	49(11)	84(11)	84(11)
2	35(12)	35(12)	35(12)	57 (8)	57 (8)	57 (8)	93 (8)	93 (8)
3	47(10)	47(10)	47(10)	63 (7)	63 (7)	63 (7)	100 (8)	100 (8)
4	55 (8)	54 (8)	54 (8)	67 (6)	67 (6)	67 (6)	105 (7)	105 (7)
5	60 (7)	60 (7)	60 (7)	71 (6)	71 (6)	71 (6)	110 (7)	110 (7)
6	65 (7)	64 (6)	64 (6)	75 (6)	75 (6)	75 (6)	115 (7)	115 (7)
7	69 (6)	68 (6)	68 (6)	78 (6)	78 (6)	78 (6)	119 (7)	119 (7)
8	73 (6)	72 (6)	72 (6)	82 (6)	81 (6)	81 (6)	124 (7)	124 (7)
9	78 (6)	75 (6)	75 (6)	85 (6)	85 (6)	85 (6)	129 (7)	129 (7)
10	82 (7)	79 (6)	78 (6)	89 (6)	88 (6)	88 (6)	134 (7)	134 (7)
11	87 (7)	82 (6)	82 (6)	92 (6)	91 (6)	91 (6)	139 (7)	138 (7)
12	92 (8)	85 (6)	85 (6)	96 (6)	94 (6)	94 (6)	143 (7)	143 (7)
13	101(11)	89 (6)	88 (6)	100 (7)	98 (6)	98 (6)	148 (7)	148 (7)
14	109(15)	92 (6)	91 (6)	105 (7)	101 (6)	101 (6)	153 (7)	153 (7)
15		96 (6)	95 (6)	111 (8)	105 (6)	105 (6)	159 (8)	158 (8)
16		100 (7)	98 (6)	119(11)	109 (6)	108 (6)	166 (9)	165 (8)
17		105 (7)	101 (6)	127(15)	114 (7)	112 (6)	175(11)	172 (9)
18		111 (8)	105 (6)		119 (7)	116 (6)	184(15)	182(10)
19		119(11)	109 (6)		125 (9)	120 (7)		193(10)
20		127(15)	114 (7)		134(11)	125 (7)		203(10)
21			119 (7)		142(15)	129 (7)		212 (9)
22			125 (9)			134 (7)		220 (9)
23			134(11)			139 (7)		228 (9)
24			142(15)			143 (7)		238(12)
25						148 (7)		247(15)
26						153 (7)		
27						159 (8)		
28						166 (9)		
29						175(11)		
30						184(15)		

OPTIONAL

Ability Score

(3)

Recall of Objects – Immediate

WORD DEFINITIONS

Age Range
5:0–17:11

MATERIALS

School Age Record Booklet

DESCRIPTION

The child has to explain the meaning of individual words.

STARTING, DECISION, AND ALTERNATIVE STOPPING POINTS

Ages	Starting	Decision
5:0–7:11	Item 1	Item 14
8:0–10:11	Item 4	Item 20/Item 24
11:0–17:11	Item 16	Item 33

Note: If you suspect that the child will have difficulty with the Starting Point for his or her age, use the Starting and Decision Points for a younger age group.

Unlike most other scales, Word Definitions has a second Decision Point for children aged 8:0–10:11. If a child continues beyond the first Decision Point at Item 20 (that is, the child does not have 3 failures or more), apply the Decision Point rule again after Item 24.

? DECISION POINT

Stop, unless

- < 3 failures on all items given; **continue** to next Decision Point.

- < 3 passes on all items given and age is 8:0 or more; **go back** to previous Starting Point.

⬡ ALTERNATIVE STOPPING POINT

After 5 consecutive failures:

- If age is 7:11 or less, **stop.**

- **If age is 8:0 or more, stop** provided that at least 3 items have been passed on the scale, or else **go back** to previous Starting Point.

ADMINISTRATION POINTS

1. The word should be repeated if the child asks for a repetition or if it is evident from the child's response that he/she misheard the word (for example, 'big fish' for 'purpose'). Responses that are usually the result of mishearing are indicated with an 'R' in the Item-By-Item Administration section.

2. If the child is unsure of a word because of differences in pronunciation, repeat the word, spell the word aloud, or write the word on paper.

3. Vary the form of question to avoid a stilted presentation. For example, once the task is clear to the child, you can simply say the word in isolation, or give the word and then say:

    Tell me what _____ is. or What's a _____?

4. Several items can be nouns or verbs; these are Items 4 ('travel'), 5 ('crash'),9 ('shiver'), 10 ('invite'), 12 ('hide'), 15 ('plan'), 17 ('trade'), 19 ('refund'), 20 ('doubt'), 25 ('consent'), and 28 ('counterfeit'). Be careful *not* to say 'What is a _____?' Instead, either present the word in isolation or say:

    What does _____ mean? ·

SCORING AND RECORDING

Record the child's response to each item verbatim to ensure accurate scoring. During administration assign tentative scores in order to use the Decision Point and Alternative Stopping Point rules. After testing use the detailed scoring rules described below to check the response scores.

Award 1 point for a correct response even if the response is given after questioning. Scoring criteria are listed in the Item-By-Item Administration section. Generally, a correct response is one which includes one or more key concepts that are central to the word's meaning. These key concepts are listed below the word in

the 'Item/Key Concept(s)' column. Scoring is based on the child's demonstrated understanding of the word's central concept(s). As long as the key concepts are communicated by the child, quality of expression should not affect scoring.

A definition that includes the target word is not usually a correct response. Such a definition, however, is correct if the response, with the target word removed, conveys the correct meaning. For example, for Item 8, 'prize', the response 'If you win a game you get a prize' is correct because after the target word is removed the response includes the concept of receiving something for winning.

Several stimulus words serve as different parts of speech. The response is correct if the child defines the word in any of its acceptable forms. For example, Item 17, 'trade,' may be defined as a verb ('to exchange') or as a noun ('commerce'). Item 28, 'counterfeit', may be defined as a noun, verb, or adjective.

For some items, a physical demonstration (either by itself or along with an oral response) may constitute a correct answer. Items for which demonstrations are acceptable are noted in the scoring rules of the Item-By-Item Administration section.

A slash is used in the Scoring Criteria to separate alternative words or phrases for a single response.

TEACHING

Provide teaching on the first two items administered (Items 1 and 2, 4 and 5, or 16 and 17) if the child fails the item. Explain the correct response by providing the specific teaching instructions included in the Item-By-Item Administration section. If the child passes the item, acknowledge the correct response.

QUESTIONING

The column in the Item-By-Item Administration section labelled 'Incorrect Responses' includes borderline responses that are marked 'Q' and that should be questioned. Also query similar responses. Write 'Q' in the space provided in the Record Booklet in front of any response (or portion) that follows questioning. The types of responses to be queried and the questions to be used are listed below. When questioning, use a non-directive approach and be careful not to provide clues to the correct answer.

1. If the child's response is along the right lines but not fully correct, say one of the following:

   Yes, but what does it mean? or Tell me more about what
   _____ means.

2. If the child uses the word in context but the context does not constitute a correct response, say:

   Tell me more. What do you mean by _____?

3. If any part of the child's response is unclear (for example, the child uses a vague pronoun), ask for clarification by saying something like:

   What do you mean by [repeat the vague portion of the response] ?

4. If the child gives a response that is a correct but unusual meaning of the word (such as a regional usage), say:

   Yes. Tell me something else that _____ means.

ITEM-BY-ITEM ADMINISTRATION

Items 1–40

All the items are administered in the same way. Introduce the task by saying:

Let's see how many words you know. I will say a word, and you tell me what it means.

For all items, present the word in one of the following ways:

_____. What does _____ mean? or

Tell me what _____ is. or

What's a _____?

After the first few items, you may simply present the word in isolation.

If the child fails either of the first two items administered, provide the specified teaching instructions given in the following item listing; if the child passes these items, acknowledge the correct responses. The letter 'Q' denotes responses which should be questioned.

Ben is in hospital. He is seriously ill. David goes to visit him in hospital
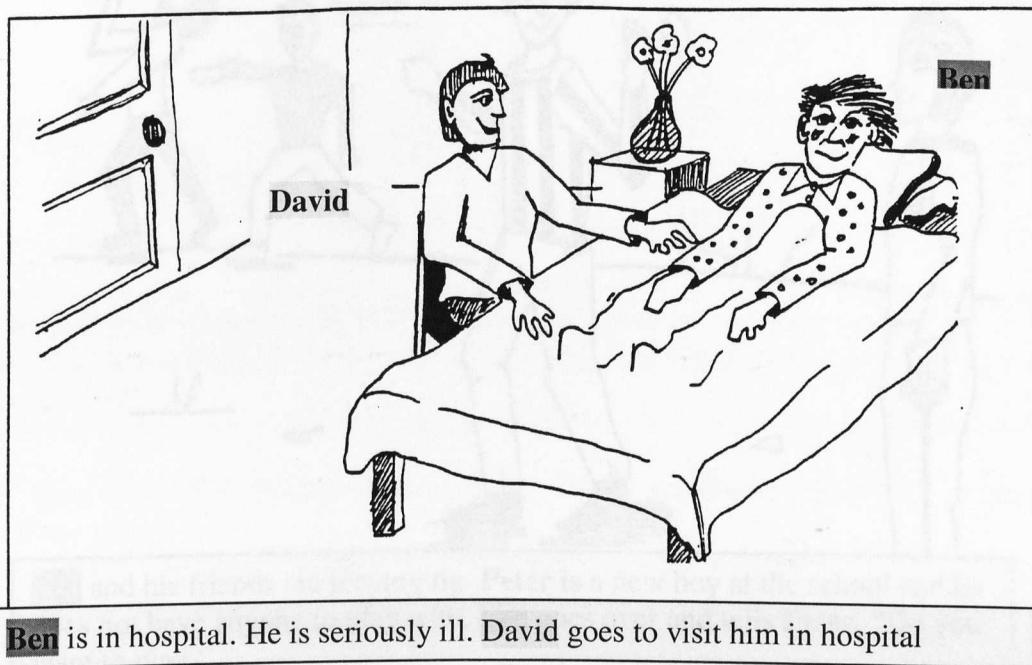
Q1: How did **David** feel when he learned that Ben is ill? – criterion emotion: sympathy

Q2: How did Ben feel when David visited him? - criterion emotion: happiness

Gary sees that Elizabeth has left her purse on the desk. During the break he walks over, picks it up and takes out 10 pounds. Elizabeth and her three friends come in suddenly and stare at him.

Q: How does **Gary** feel? – criterion emotion: shame

Lee and his friends are playing tig. **Peter** is a new boy at the school and he does not have anyone to play with. Lee goes over and tells **Peter**, "Do you want to play?

Q1: How did **Peter** feel when he did not have anyone to play with? – criterion emotion: sadness

Q2: How did **Peter** feel when Lee told him to play with them? – criterion emotion happy

Gerald has driven into a safari park. His car has broken down and the larger rhino is charging straight at him.

Q: How does **Gerald** feel? - criterion emotion: fear
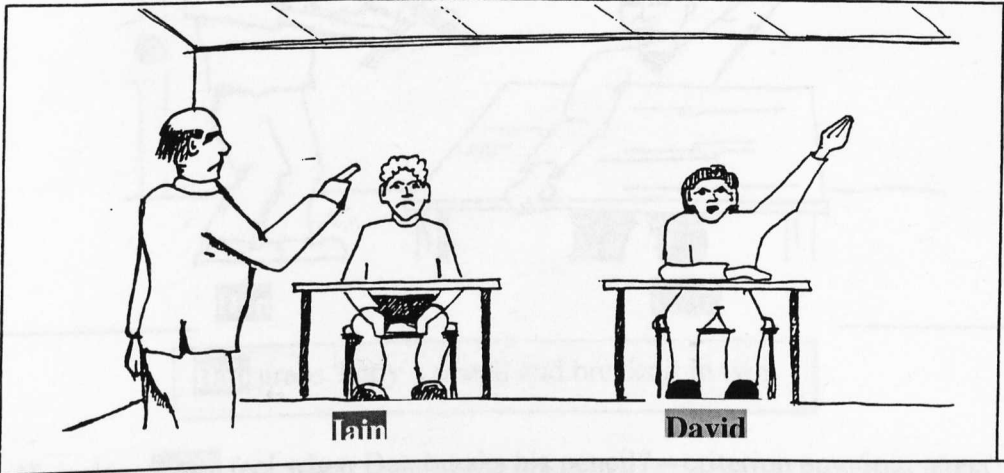
The teacher hears somebody talking, he thinks it was Ian and he gives him a row. But it was actually David who was talking. Just then David says "Sir it was me not Ian".

Q1: How does **the teacher** feel when he hears somebody talking? - criterion emotion: angry

Q2: How does David feel when the teacher is giving a row to Iain? – criterion emotion: guilty

Q3: How does **the teacher** feel when he realises that it was not Iain who did it? – criterion emotion: embarrassment

Mary has to give a speech at school. She is standing at the front of the assembly hall in front of everyone. She cannot remember what she has to say. Everyone stares at her.

Q. How does **Mary** feel? – criterion emotion: embarrassment
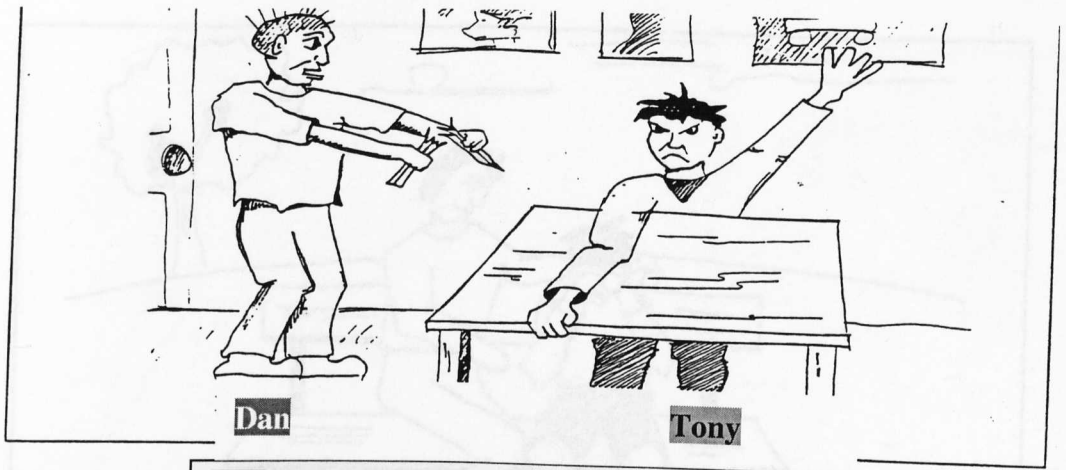
Dan grabs **Tony**'s pencil and breaks it in two

Q1: How does Tony feel **when** Dan breaks his pencil? – criterion emotion: anger

Q2: How does Dan feel **after** he breaks Tony's pencil? (exploratory question, no criterion emotion)

Neil walks towards the school gate when he sees one of his friends. He waves and he does not see the gate in front of him. He bumps into the gate.

Q: How does **Neil** feel? – criterion emotion: embarrassment
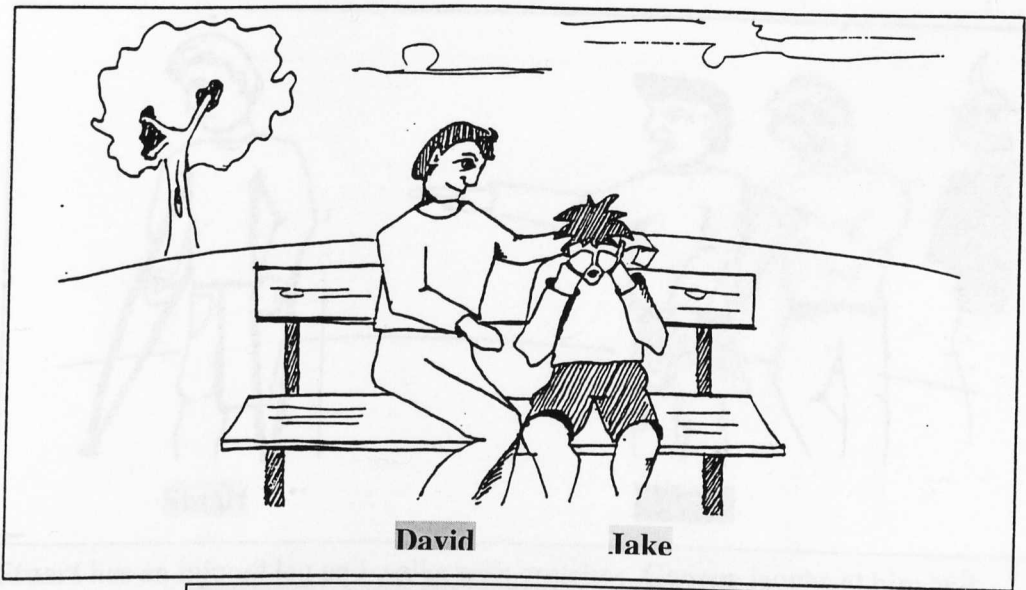
David and Jake are friends, Jake's dog has died.

Q1: How does **Jake** feel? – criterion emotion: sadness

Q2: How does David feel? - criterion emotion: sympathy

John has entered a fishing competition and he wanted to win. So he bought a large fish from the fishmonger. However, one of the judges was the owner of the shop. This man told everybody what John had done.

Q: How does **John** feel? – criterion emotion: shame
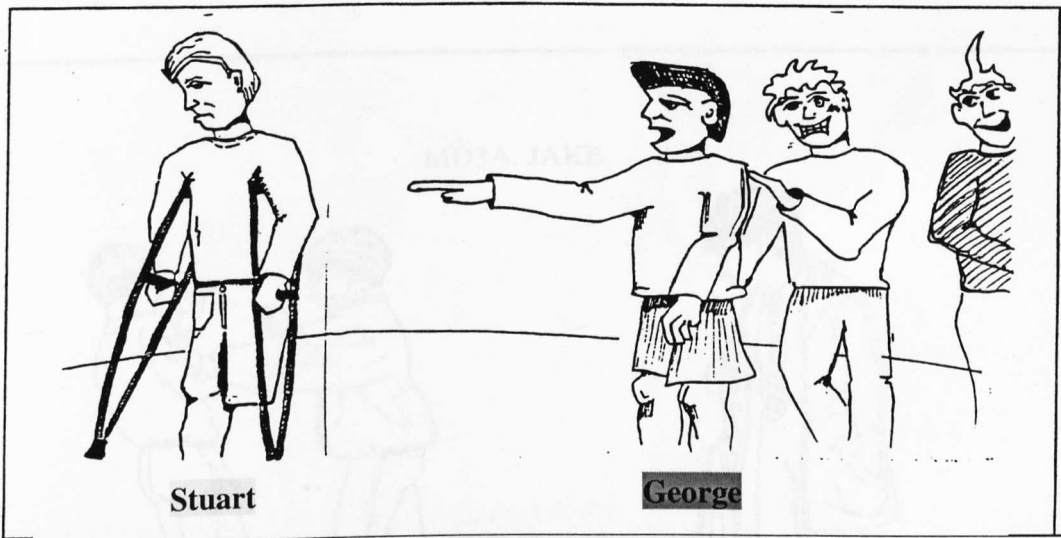
Stuart   George

Stuart has an injured leg and walks with crutches. **George** laughs at him and shouts to his friends: "Look at the wimp that walks with a limp". Mary, passes by hears what George says and goes to the headteacher telling him what happened. The headteacher gets George in the assembly hall, and gives him a huge row in front of the whole school.

Q1: How does **Stuart** feel **when** George laughs at him? – criterion emotion: sadness

Q2: How does **George** feel, when the headteacher gives him a row in front of the whole school? - criterion emotion - shame

Mark is camping in the woods in America. He wakes up and he suddenly sees a poisonous snake.

Q: How does **Mark** feel? – criterion emotion: fear

MD3A. JAKE

Jake is going home after school when he sees a bully pushing and teasing another boy. As he watched, he saw the bully push the other boy on the road and hit him. Jake then went home.

Q1: How did **Jake** feel when he saw the boy being pushed by the bully? - criterion emotion: sympathy

Q2: How did **the boy who was being bullied** feel? - criterion emotion: fear

Q3: How did **Jake** feel **when he went home** after seeing the boy being who was being bullied? - criterion emotion: guilty

Elsie wanted a rabbit for years now. Today she has her birthday. Her mother comes home with a rabbit for her.

Q: How does **Elsie** feel? – criterion emotion: happy
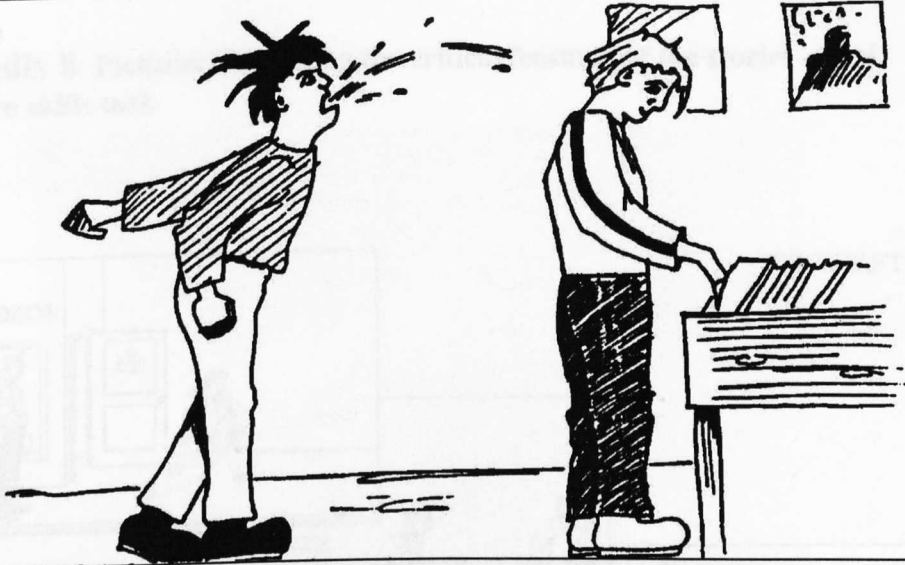
Keith is looking at books in school library. Michael spits at him.

Q1: How does **Keith** feel? – criterion emotion: anger

Q2: How does **Michael** feel after he spits at Keith? - exploratory question. No criterion emotion established.
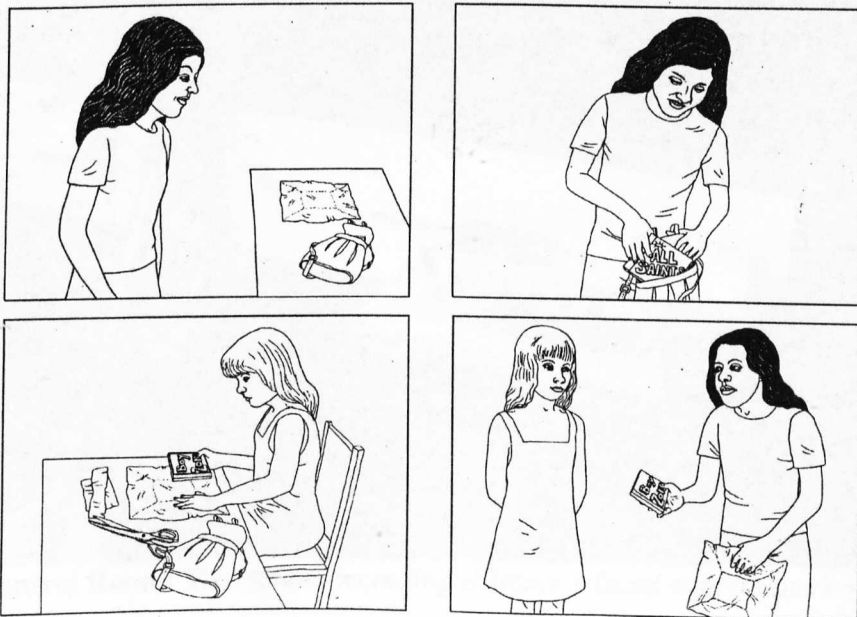
Tim throws a book at his friend. His friend does not catch it and it smashes into another child's face.

Q. How does **Tim** feel? – criterion emotion: guilt

Appendix 8. Pictures illustrating the critical features of the stories - High cognitive skills task

PT4 THEFT
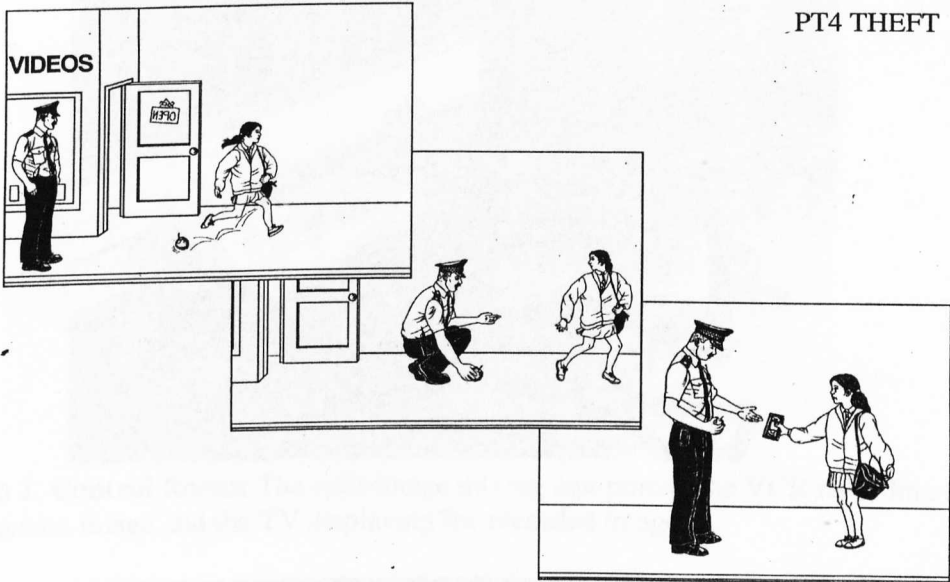
PT2 BIRTHDAY

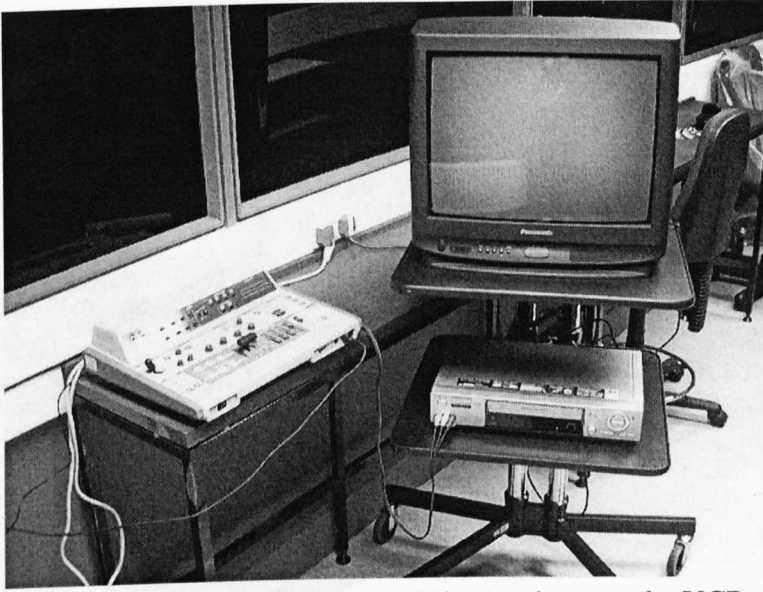Appendix 9. **Photographs illustrating the experimental setting**

Photo 1. Control Room: The split-image mixing equipment, the VCR recording the half-screen image and the TV displaying the recorded image.
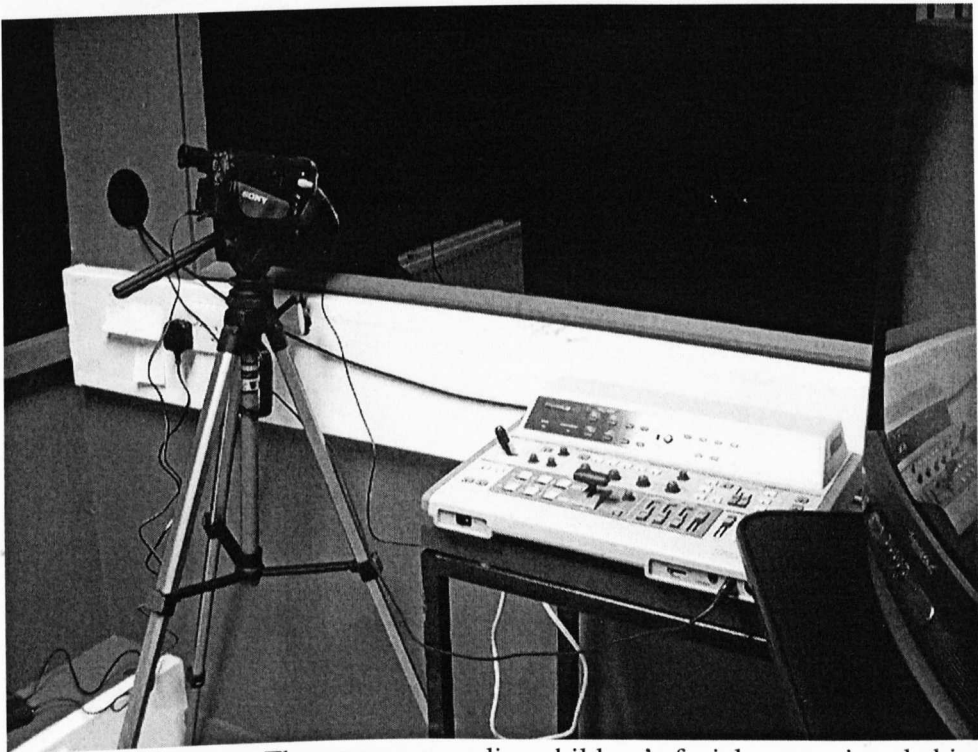

Photo 2. Control Room: The camera recording children's facial expressions behind the one-way mirror

Photo 3. Psychophysiological laboratory: The acquiring equipment connected to the specially designed equipment for triggering automatically the acquisition (by pressing the start button of the VCR), the VCR from which the presentation of the stimulus film would be presented to the child (in the observation laboratory).