

**Anxiety, appraisal and coping: Socio-emotional
deficits in children with high-functioning autism
spectrum disorders**

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**A thesis submitted to the University of Strathclyde in
fulfilment of the requirements for the Degree of
Doctor of Philosophy (PhD) in Psychology**

**School of Psychological Sciences and Health
University of Strathclyde**

2011

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A handwritten signature in blue ink, appearing to read 'Sulpaitya', written over a horizontal line.

Date: 25 Sep 2011

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Acknowledgements

I express my sincere thanks to my supervisors Dr Lisa Woolfson and Dr Simon Hunter for their invaluable support and guidance throughout the course of this research. Working under their guidance was an enriching and rewarding experience. I take this opportunity to thank my examiners, Prof. Patricia Howlin and Prof. Kevin Durkin for their extensive and critical appraisal of my work.

My sincere thanks to the head teachers, clinicians, managers and coordinators of all the institutions I visited for data collection. I am extremely thankful to all the participant children and their parents for their cooperation, as without their help this study would not have been possible. I would also like to thank the Department of Psychology, University of Strathclyde for giving me this opportunity.

I would also like to thank my parents and husband for their encouraging comments and unconditional, non-judgemental emotional support. Last but not the least, thanks to God, who is always the source of my strength and hope.

Abstract

This thesis addresses the role of cognitive appraisals in determining negative emotions, coping and negative attributions in the groups of children with high-functioning spectrum disorders (HFASD) and typically developing (TD) children, across three linked, yet independent studies, carried out over a period of 2 years. The sample sizes varied from 28 to 42 children in the HFASD and TD groups across Studies 1, 2 and 3. A combination of standardised self-report questionnaires, technique of narrative recall and hypothetical vignettes were used for the purpose of assessment. Some scales were adapted to suit the specific needs of the participants of the current study.

Studies 1 and 2 found significantly different scores for the appraisal dimensions of self-accountability, emotion-focused coping potential, problem-focused coping potential and future expectancy, in the case of the HFASD group than the TD group. These appraisal dimensions were also found to have a significant correlation with TOM ability, fear, guilt, sadness, anxiety, avoidance coping and negative attribution style. An interesting finding for both the groups was having significantly different mean values for the appraisal dimensions across three conditions of hypothetical frustrating vignette, characterised by manipulated levels of emotional action readiness levels.

These novel findings provided useful preliminary insights into a relatively underdeveloped area of research; and further investigation of appraisals in children with HFASD might be of interest to future studies.

Chapter 1: Introduction

Anxiety, appraisal and coping: Socio-emotional deficits in children with high-functioning autism spectrum disorders

Children with autism are known to experience negative emotions, anxiety, depressive symptoms, and to use avoidance coping in their daily lives. It is important to understand the nature of such negative experiences, in order that an optimal environment for their growth and development can be provided.

This thesis begins with the presentation of a general theoretical background to the three studies that make up the current research. Chapter 2 outlines the controversy around the diagnostic status of Asperger Syndrome (AS) in relation to high-functioning autism (HFA), arguing that there is a lack of evidence to reliably distinguish AS from HFA. Therefore, AS and HFA should be seen on the wider autism spectrum disorder (ASD); they are referred to as high-functioning autism spectrum disorders (HFASD) in this dissertation. A critical review of the research evidence on fears and co-morbid anxiety symptomatology in children with autism is also presented in Chapter 2. This chapter aims to justify the sample selection strategy of including children with AS and HFA in a single group of HFASD, and to build a rationale for the investigation of fears and anxieties.

Section 1 consists of Chapters 3-6 and presents further literature review as well as methodology, results and discussion chapters for Study 1. Chapter 3 begins with a critical review on theories of fear and anxiety for children with and without autism; and argues for the potential relevance of cognitive appraisals in understanding fears.

As this is the first empirical study to investigate cognitive appraisals in children with HFASD, there is a dearth of relevant literature to draw on. So, research studies on appraisals carried out with other groups of children without autism are reviewed in Chapter 3. Since the theory-of-mind deficit (TOM) account is a common explanation for emotional difficulties in the case of children with autism, arguments linking TOM ability and appraisals are also presented in Chapter 3. This chapter concludes by proposing evidence based hypotheses and exploratory research questions for an investigation in Study 1. Chapter 4 provides information on the methodology of Study 1 and procedural details on how 29 children in the HFASD group and 28 in the TD group were recruited through five main sources of: National Autistic Society, National Health Service, local schools, parent support groups and the University of Strathclyde campus.

A description of administration procedures and statistical characteristics of the measures used in Study 1, for example, 'narrative descriptions', 'hypothetical frustrating vignette', 'Strange Stories' (Happé, 1994), 'Spence Children's Anxiety Scale' (Spence, 1998), 'vocabulary sub-test of WISC-IV scale' (Wechsler, 2003) and 'Childhood Asperger Syndrome Test' (Scott, Baron-Cohen, Bolton & Brayne, 2002) are presented. This chapter also presents a brief description of the additional study carried out to assess the accuracy of data collected by telephone due to practical problems in recruiting the required number of participants in the local areas of Scotland. Full description of this study is presented in Appendix 7.

Chapter 5 provides output from *t*-tests for two independent groups, 3*2 mixed ANOVA and correlation analyses to assess between-group differences for the appraisal dimensions across the three action readiness conditions of the 'hypothetical

frustrating vignette', fear, anxiety, TOM ability; and also association of appraisals with fear, anxiety and TOM ability. Chapter 6 discusses the findings from Study 1 highlighting novel results on impaired appraisals in the HFASD group and their association with other variables. Section 1 concludes by identifying limitations in the design of Study 1, specifically relating to the extent to which ecological validity of the findings from the *preparing to advance* and *preparing to retreat* versions can be established; and how reliable the techniques employed in Study 1 might be for a reliable assessment of cognitive appraisals.

Following limitations identified in Study 1, Study 2 is presented in Section 2, consisting of Chapters 7-10. Chapter 7 critically reviews previous research evidence to argue for the relevance of an assessment of two new variables of coping and social difficulties, in relation to appraisal dimensions in children with HFASD. An overview of the history on the development of research into coping, its functions and types of coping strategies are presented. This chapter also presents a critical review of previous studies that found a significant association between avoidance coping and social difficulties in children without autism. Unlike appraisals, there is limited research evidence indicating the use of avoidance and emotion-focused coping by children with autism. Chapter 7 presents specific hypotheses to re-investigate appraisals in relation to the negative emotions of fear, guilt and sadness, and avoidance coping. New hypotheses to assess association between coping and social difficulties in children with HFASD are also proposed. In this chapter, a review of research studies that investigated the relationship between coping and cognitive appraisals in children without autism is presented to propose a possible link between appraisals and coping in children with HFASD.

Chapter 8 is the methodology chapter for Study 2, which presents a description of improved methodology in comparison to Study 1. Administration methods and psychometric properties of the measures to assess the new variables of coping (KIDCOPE- Spirito, 1988) and social difficulties (Paediatric Symptom Checklist- Jellinek, 1986) are presented in Chapter 8. Chapter 9 reports results from *t*-tests showing significant differences between the HFASD and TD groups for appraisal dimensions, negative emotions, approach and avoidance types of coping and social difficulties. Output from Pearson's correlation and linear regression analyses for an assessment of the association between these variables are also presented in this chapter. Chapter 10 discusses these results to highlight relevant findings on impaired appraisals that were consistent across Studies 1 and 2; and other findings of higher scores for the negative emotions, avoidance coping and greater social difficulties in HFASD group; and how these might be inter-related. Chapter 8 identifies limitations in the design of Study 2 and suggest directions for further research.

Drawing from the limitations and directions of Study 2, Section 3 consists of chapters 11-14 and presents theoretical background to rationalise the investigation of two new variables: attributions and depressive symptomatology. It is argued in chapter 11 that since appraisals were consistently found to be impaired in Studies 1 and 2, despite using two different methodologies, these might be associated with more stable cognitive biases, namely negative attribution style. Chapter 11 therefore provides a critical review of limited research evidence on negative attributions in children with HFASD and also present arguments to rationalise the study of attributions in relation to cognitive appraisals. The association of negative attributions with depressive symptoms are also examined in Study 3. At the end of

this chapter, a list of hypotheses and exploratory research questions are presented. Chapter 12 provides information on the research design, summarising how children from Studies 1 and 2 were contacted and recruited for Study 3 in order to assess longer-term association between the appraisals assessed during Studies 1 and 2 with attributions measured at Study 3. A description of the Birlson Depression Inventory (Birlson, 1981) to assess the presence of depressive symptoms and Children's Cognitive Style Questionnaire (Mezulis et al., 2006) to measure attributions in both the groups is also presented in this chapter.

Chapter 13 present the results of Study 3 with corresponding statistical analyses consisting of *t*-tests and Pearson's correlation analyses. Chapter 14 is the discussion chapter for Study 3, where the findings on significantly higher mean scores of the negative attributions and depressive symptoms in the HFASD group; and significant association of the appraisals and attributions in longer-term are discussed. This thesis ends with Chapter 15's discussion of key findings from all the three Studies 1, 2 and 3, in which limitations across the three studies are identified; suggestions are made for future research and implications are suggested. This chapter will also outline the reasons why fewer significant correlations were found in the TD group in the current study, while previous research has suggested many more possible associations in typically developing populations.

Chapter 16 is the conclusion chapter that highlights key findings across the three studies: specifically relating to between-group differences for the appraisals of coping potential, expectancy about the outcome and the extent of responsibility assumed for a negative social situation; also for the negative emotions of fear, guilt and sadness, avoidance coping, and the negative attribution style characterised by

higher scores for the internality, stability and globality dimensions. The associations among these variables will also be discussed.

Chapter 2: Issues in diagnosis of high-functioning autism and review on co-morbid fears and anxiety

2.1 Introduction

This chapter aims to build a rationale for the selection and classification of children with HFA and AS in the single category of HFASD. The chapter thus gives an overview of the history and current research on the diagnostic status of AS, primarily in children and argues that it is essentially similar to HFA. This chapter also presents research evidence for the occurrence of excessive fear and anxiety in children with autism; and highlights limitations in earlier research to warrant the investigation of fears and anxiety in the current study.

2.2 Historical overview: Simultaneous conceptualisation of two similar disorders

Interest in the definitions of ‘autistic psychopathy’ by Asperger (1944) and its similarities or differences to the diagnostic category of ‘autism’, proposed by Kanner (1943), was largely initiated by Wing in 1981, who also coined the term ‘Asperger Syndrome’ (AS) for Asperger’s ‘autistic psychopathy’. Wing argued that people with AS had well developed language and communication skills with no intellectual impairment, and that they should be classified as people with high functioning autism (HFA); and that Kanner’s ‘autism’ with language delays or cognitive impairments should be seen at the lower functioning end of ASD.

Wing’s publication stimulated considerable interest in the research community and within a decade, three different diagnostic systems (Gillberg & Gillberg, 1989; Szatmari, Bartolucci & Bremner, 1989; Tantam, 1988) had emerged, which differed

not only from each other, but also from the Wing's and Asperger's original description (Volkmar & Klin, 2000). Ghaziuddin, Butler, Tsai and Ghaziuddin (1992) investigated the extent of overlap between these sub-systems and found that while these definitions overlapped; they were not completely identical, resulting in a lack of consensus over their distinction and definition. Such a confusion in the diagnostic differentiation between AS and autism still exists to the present day (Volkmar, State & Klin, 2009), despite development of the *DSM-IV* (American Psychiatric Association, 1994) and the *ICD-10* (World Health Organisation, 1993), in an attempt at standardisation of the diagnostic status of AS and autism. Each identified AS as a separate diagnostic category from autism. The *DSM-IV* stated that the basic triad of social impairments (poor non-verbal communication, poor empathy, and failure to form friendship) are the only necessary features for diagnosing AS. It referred to the possibility of motor clumsiness and all absorbing interest patterns only as associated impairments. There was however no reference to cognitive abilities, language and communication skills, social plays, and age of onset or idiosyncratic language.

Both these systems have thus been criticised by researchers as insufficient for providing diagnostic clarity between AS and autism and therefore, in their claim that AS is distinct from autism. In a large multi-site field trial, Klin, Lang, Cicchetti and Volkmar (2000) found that a group of experienced clinicians demonstrated low inter-rater reliability, when applying the *DSM-IV* criteria for autism, but the criteria could nevertheless be considered of value since these provided structured guidance to a group of inexperienced clinicians, for whom the reliability rates were high. This finding that the experienced clinicians could not reliably apply the *DSM-IV* diagnostic

criteria raised serious questions about its utility. In fact, Miller and Ozonoff (1997) examined the case records of patients described by Asperger (1944) and argued that they would be diagnosed with HFA according to the *DSM-IV* criteria, if re-examined. Studies carried out between 1995 – 2009 have also reported difficulties in the diagnosis of AS, as distinct from autism using the *DSM-IV/ICD-10* criteria (e.g., Eisenmajer, Prior, Leekam et al., 1996; Kadesjo, Gillberg & Hagberg, 1999; Leekam, Libby, Wing et al., 2000; Manjiviona & Prior, 1999; Mayes, Mayes & Callhoun, 2001, 2004; Smith, Klin & Volkmar, 2005; Szatmari, Archer, Fisman et al., 1995). These findings thus raised questions about the potential utility of using the *DSM-IV* criteria for the differential diagnosis of AS from autism as the criteria seem to suggest that AS better belongs to the ASD.

2.3 Current diagnostic status of Asperger Syndrome

A current research trend therefore, is to ignore the separate diagnostic criteria for AS and autism postulated by the *DSM-IV* and *ICD-10*; and simply collapse the two categories instead (e.g., Beaumont & Newcombe 2006; Dahlgren, & Sandberg, 2008; Humphrey & Lewis, 2008). In these studies, HFA and AS are not considered as the separate diagnostic categories, but are combined in a single group. This suggests that the *DSM-IV* and *ICD-10* systems are either considered unreliable or that the researchers might not be interested in differences between these two groups. While there might be some qualitative differences between AS and autism (style of social interaction- Ghaziuddin, 2008; speech or motor skills- Ghaziuddin & Gerstein, 1996; Paul, Orlovski, Marcinko et al., 2009; Rinehart, Brereton, Bradshaw et al., 2006), these might not necessarily have any influence on the clinical features in long-term. So, such differences then may be better researched and understood as finer qualitative

differences between the sub-groups of ASD (Sharma, Woolfson, & Hunter, 2011).

Therefore, a better approach might be to consider AS on the higher-functioning end of ASD and not as a separate diagnostic category, as postulated by the *DSM-IV*.

It should be noted that such a change has already been suggested by the forthcoming *DSM5* (APA, forthcoming: www.dsm5.org.uk), whereby the separate diagnostic category of AS will be removed and people presenting symptoms related to autism and with average IQ, will be given the diagnosis of autism on the higher-functioning end of the ASD spectrum. Therefore, in this study, children with AS and those on the higher-functioning end of autism spectrum were considered as belonging to one category and referred to as children with HFASD, *i.e.* higher-functioning autism spectrum disorders.

2.4 Fear and anxiety disorders in children with autism

Fear in the *DSM-IV* (APA, 1994) is defined as a perception or an anticipation of threat in the environment and is followed by an increased heart rate, tensed muscles; and leads to fight or flight reactions. Fear has been classified as a negative affect that is central to the experience of other negative emotions and anxiety in typically developing (TD) populations (e.g., Barlow, Chorpita & Turovsky, 1996). Failure to resolve fear, despite the attempts to do so on the part of an individual is thought to lead to the formation of irretrievable psychological conflicts, commonly known as phobias or anxiety disorders (Klein, 2009). Anxiety is classified as a clinical disorder and differs from fear in the degree of severity, frequency, persistence of symptoms and associated difficulties, such as depression (Turner, Beidel & Townsley, 1992). Anxiety disorders are thought to occur in 2-15% of general population (APA, 1994) and estimates for the occurrence of clinical symptoms of anxiety disorders in

children with autism are even higher, varying from 11-84% across a lifetime (White, Oswald, & Ollendick et al., 2009).

Anxiety is one of the most commonly reported problems in children with autism (Ghaziuddin, 2002). Prevalence estimates of co-morbid symptoms of anxiety symptomatology were recently reported to vary from 11 to 84% across a life-time (White, Oswald, & Ollendick et al., 2009). Other studies which assessed a smaller age range and specific sub-categories of anxiety disorders reported an estimated prevalence rate of 40-45% in children with autism (Bellini, 2004, Bradley, Summers, & Wood et al., 2004; Simonoff, Pickles, & Charman, et al., 2008).

Case studies have shown that the symptoms of anxiety and unusual fears, such as of bathrooms (Howlin, Merchant, & Rutter et al., 1973), toilets (Jackson & King, 1982), fear of going outside (Love, Matson, & West, 1990), riding a school bus (Luiselli, 1978), medical procedures, strangers (Evans, Canavera, & Kleinpeter et al., 2005) and swimming pool (Rapp, Vollmer, & Hovanetz, 2005) are common across ASD. The *DSM-IV* (APA, 1994) stated anxiety-like symptoms as a common associated feature for autism and specifically proposed six frequently occurring categories of anxiety disorders: generalised anxiety disorder, obsessive-compulsive disorder, panic attack and agoraphobia, social phobia, separation anxiety and physical injury fears. Further evidence for the frequent occurrence of fears in children with autism comes from between group studies comparing children with clinical levels of anxiety to children already diagnosed with autism (Farrugia & Hudson, 2006; Melfsen, Walitza, & Warnke, 2006; Russell & Sofronoff, 2005).

An exploratory review of studies published from 1995-2010 examining prevalence of fears and anxiety in children with autism was carried out using different combinations of keywords, such as anxiety, fear, autism, Asperger Syndrome on the following databases: Web of Science, PsycINFO, Omnifile FT Select and MEDLINE. Studies that assessed the outcome variable of fear or anxiety symptomatology in a group of children with autism were retained for discussion here. Single case studies were excluded. The application of these inclusion and exclusion criteria led to a selection of 25 research studies carried out with children and young people ranging from 2-18 years old, as shown below in Table 2.1.

The studies presented in Table 2.1 indicates the possibility of a high occurrence of fears and anxieties in children with autism in comparison to children who do not have autism^{1, 7, 9, 17, 21, 24}, clinically anxious children^{3, 13, 16}, and other children with developmental disabilities^{3, 5, 8, 10}. Eight studies presented here^{5, 8, 10, 12, 13, 14, & 21} showed a higher occurrence of anxiety in the autism group in comparison to the control group of TD children. Other studies^{2, 4, 6, 22, 25} presented in Table 2.1 assessed fears and anxieties within the spectrum of children with autism and interestingly, some found higher scores for anxiety in children with IQ>70 compared to those with IQ<70. This indicates that children with HFA or AS who are known to have an average or above average IQ might exhibit even higher levels of anxiety. A higher IQ might allow children with HFA/AS to perceive a larger range of anxiety causing environmental stimuli and thus experience more fears and anxiety.

Table 2.1.

Studies investigating excessive fear and related disorders in children with autism

Authors	N of children	Age	Findings
1. Muris et al. (1998)	15 AD; 29 PDD-NOS	5-7	70% met the criteria for OCD; 20% agoraphobia; 12%- separation anxiety; 9%- social phobia.
2. Tonge et al. (1999)	75 AS; 52 HFA	6-7	Both the groups scored high on anxiety, symptoms were in the clinical range.
3. Green et al. (2000)	20 AS: 20 conduct disorder	11-19	AS group scored higher than the conduct disordered group on anxiety symptoms such as compulsions and panic.
4. Kim et al. (2000)	40 AD; 19 AS	4-6	13.6% showed clinical symptoms of generalised anxiety disorder, 8.5% separation anxiety & 54.2% excessive anxiety of holidays, going in public.
5. Gillott et al. (2001)	15 AD: 15 TD: 15 LI	8-12	Children with AD had higher scores for obsessive-compulsive disorder and higher separation anxiety.
6. Bellini (2004)	19 HFA, 16 AS; 6 PDDNOS	12-18	49% of the sample scored above level of clinically significant social anxiety.
7. Bradley et al. (2004)	12 autism, 12 without autism	Mean age: 16.33 (autism); 16.08 (without autism)	Participants with autism had significantly higher scores of anxiety than the participants without autism.
8. Evans et al. (2005)	25 ASD:43 Down Syndrome	4-11	Children with autism had excessive fear of medical procedures and strangers, higher incidence of anxiety disorders.
9. Gadow et al. (2005)	103 AD, 80 AS, 118 PDD-NOS	8-9 yrs	Children with AD & AS had high scores for anxiety disorders of generalised anxiety, separation anxiety, specific phobia-not significantly different from PDD-NOS.

Authors	N of children	Age	Findings
10. Gupta & Sharma (2005)	8 HFA; 8 cerebral palsy; 10 TD	7-12	The HFA group had fear of strangers, textures, compared to the other two groups.
11. Russell & Sofronoff (2005)	65 AS; clinically anxious from Spence (1998) study; TD from Nauta et al. (2004) study	10-13	The AS group scored equal to the clinically anxious group on panic attack and agoraphobia, and social phobia.
12. Weisbrot et al.(2005)	Preschool: 67 AD; 24 AS; 91 PDD-NOS; 135 non-AD School-age: 103 AD; 80 AS; 118 PDDNOS; 191 non-AD	Preschool: 3-5 years; School age: 6-12 years	In the preschool group, teachers rated children with AD exhibiting higher fears and anxiety than non-AD. No significant differences in fears between the AD sub-types. In the school age group, both parents and teachers reported higher anxiety in the AD group.
13. Farrugia & Hudson (2006)	29 AS: 30 TD: 34 anxiety disorder	12-16 years	Children with AS had highest scores for all the six categories of the DSM-IV anxiety disorders than the other two groups
14. Lecavalier (2006)	487 PDD: 50 rated by parents, 184 by teachers, & 303 by both	Mean age= 9.6 years	Children with PDD had high scores on anxiety when assessed through both parent and teacher report measures.
15. Leyfer et al. (2006)	109 autism	5-17 years	44.3% met the DSM-IV criteria for specific phobia, 37.2%- obsessive-compulsive disorder; 11.9%- panic disorder, 7.5%- social phobia; 2.4%- generalised anxiety
16. Melfsen et al. 2006	7 AS, 72 anxiety disorder; 1197 TD	7-18 years	Children with AS, obsessive-compulsive disorder, had high scores on social anxiety.
17. Pearson et al. (2006)	26 AD; 25 PDD-NOS	4.2–18.7 years	Retrospective review of clinical case records of participants showed no significant difference in anxiety between AD and PDDNOS groups.
18. Thede & Coolidge (2006)	15 HFA; 16 AS	5-17 years	AS group scored higher than other group on measures of generalised anxiety disorders and OCD.

Authors	N of children	Age	Findings
19. Sukhodolsky et al. (2007)	171 PDD	5-17 years	43% of their sample qualified for the clinical diagnosis of at least one anxiety disorder outlined in the DSM-IV. Individuals with higher IQ had higher scores for anxiety.
20. Hutton et al. (2008)	135 ASD	Follow-up till 21 years of age	39 developed at least one new psychiatric disorder; 5 had OCD, 8 had affective disorder with obsessions, 7 had affective disorders
21. Kuuiskko et al. (2008)	54 AS/HFA; 305 TD	9-14 years	Children with AS/HFA scored higher on measures of social phobia and disorders
22. Simonoff et al. 2008	112 ASD	10-14 years	High scores on anxiety and psychiatric disorders found in children with ASD.
23. Matilla et al. (2010)	50 HFA/AS	Mean age=12.7 years	42% of sample had anxiety disorders; 28% had specific phobias and 22% had OCD
24. Mazefsky et al. (2010)	20AD; 8 autism; 3 PDD-NOS	10-17 years	39% of sample met the DSM-IV criteria for anxiety disorders
25. Witwer & Lecavalier (2010)	61 children with ASD	Mean age=11.2 years	Children with IQ<70 and language difficulties/ delays had lower scores for anxiety than children with IQ>70.

Note: AD- Autistic Disorder; PDD- pervasive developmental disorders; PDD-NOS- pervasive developmental disorders-not otherwise specified; LI: language impairment.

Other studies that compared anxiety levels between children with autism and children with clinical levels of anxiety found similar scores in both the groups. For example, three studies^{13, 11, 16} found equal levels of anxiety, such as, panic attack and agoraphobia, separation anxiety, physical injury fears etc., but even higher levels of social phobia and obsessive compulsive disorders in the groups of children with autism compared to the groups of children with clinical levels of anxiety. A longitudinal study by Hutton and colleagues²⁰ assessed presence of anxiety and

related psychiatric disorders in a group of 139 individuals with the diagnosis of autism with an IQ>30 that was obtained before the age of 16 years. This sample was followed up till the age of 21 years; and it was found that of their total sample, 39 individuals with autism developed an affective disorder, which was independent of their initial diagnosis of autism.

Taken together, these studies indicate a higher occurrence of exaggerated anxiety and unusual fears in children with autism. Findings also suggest that although fears and anxieties occur across the whole autism spectrum, these are more common in children with HFA since they have above average IQ¹³. Such anxieties could have a debilitating effect on the lifestyle and psychological well-being of children as anxiety often occurs with co-morbid pathological conditions of depression, loneliness and excessive worry (Tantam, 2000). Children with autism are already known to exhibit social difficulties, so, it is important to investigate underpinning factors to the experience of fears and anxieties in children with autism; this will therefore be examined in Study 1.

2.5 Limitations in anxiety research in case of children with autism

In anxiety research, it has been shown that in the case of TD children, there is a poor concordance between parent/ teacher and child report measures for the assessment of anxiety and social-emotional functioning (Engel, Rodrigue, & Geffken, 1994). Similarly, in the case of children with autism, a low degree of agreement was found between parent and child reports for the measurement of socio-emotional functioning (Meyer, Mundy, & Vanhecke et al., 2006). In a recent review by MacNeil, Lopes and Minnes (2009), it was argued that a rigorous methodology should consist of multi-modal assessment, *i.e.* include at least child and parent report

measures and also include an IQ matched group of control participants in their sample, when assessing fears and anxiety.

However, the studies presented in Table 2.1 tend to rely on either child or parent reports only, thus raising doubts about the consistency of their findings across the informants. Eleven studies^{1, 2, 4, 8, 17, 18, 19, 20, 22, 24, 25} presented in Table 2.1 only used a parent-report scale for an estimate of anxiety in their sample, three used only a child-report measure^{7,15, 16}, while the other three studies^{9, 12, 14} used both a parent and a teacher report measure, but no child-report instrument was used. Findings from these studies thus provide limited information on the nature and frequency of fears in children with autism, also because only parent perspectives were investigated.

Furthermore, although the remaining eight of 25 studies presented in Table 2.1 used parent and child report measures^{3, 5, 6, 10, 11, 13, 21, 23}, their methodology could still be challenged on the basis of their sample type and sample selection procedures. Three out of these seven studies^{3, 6, 11} did not have a control group, so their findings on anxiety in children with autism could not be compared to groups of children without autism. In other two studies^{5, 13}, the participants' IQ was not controlled for and the age-range of community based sample in the study by Matilla²³ was narrower than the age of the combined group consisting of community and clinic based samples; so, these findings might as well be biased. Further, in the remaining two studies^{10, 21}, no formal IQ assessment was carried out, nor was the diagnosis of participants with autism reconfirmed; so, their sample might not actually comprise children with HFA.

In order to address such flaws in previous anxiety research, specifically related to the non-inclusion of child and parent-report measures, Study 1 will assess anxiety in children with HFASD using both a parent and a child report measure. Cognitive ability of children in the current study will also be reconfirmed by assessing the IQ.

2.6 Summary

Previous research evidence and the forthcoming *DSM5* indicate that the diagnostic distinction between AS and HFA might be unreliable. This discussion bears on the sample selection procedures as both children with AS and children with HFA were recruited for this study, and were included in the single category of HFASD. Unusual fears and exaggerated anxiety frequently occur in children with autism and even higher in children with HFASD. Theories and research evidence on correlation of fears and anxiety in both children with and without autism will be examined in the next chapter.

Chapter 3: Are appraisals associated with fear and anxiety in children with high functioning autism spectrum disorders?: Literature review for Study 1

3.1 Introduction

A critical review of previous research will be presented to argue for the case that cognitive theories have the greatest potential to enable understanding of the nature of fears and anxiety in children with and without autism. This chapter will propose an association between appraisal dimensions and fear in children with autism.

Background research and theoretical underpinnings to cognitive appraisals will be reviewed prior to a discussion of evidence from the limited body of literature on other cognitive deficits, specifically in relation to fear and anxiety in autism.

3.2 Theories of fear and anxiety in children with and without autism

Earliest conceptualisations on how fears develop in humans came from psychoanalytic theories, whereby fear was seen as a direct cause of anxiety disorders and was thought to be caused by hidden conflicts in the unconscious mind of an individual (Freud, 1959). Freud's theory was however criticised for a lack of empirical support (Wolpe & Rachman, 1960), but the concept of fear as a cause of anxiety disorders continued to convince other researchers. In the 1960s, scientists turned their attention back to the learning theorists that were inspired by the early work of Watson (Watson, 1913, 1928). Learning theories proposed that a person learns to connect intense fear with otherwise neutral objects or situations in an unconscious and involuntary fashion, through the procedures of operant conditioning (Eysenck & Rachman, 1965; Watson & Rayner, 1920). They also proposed that individuals may prevent the ex-

tion of phobias over time in the absence of original eliciting stimuli by classically conditioned autonomic arousal (Mowrer, 1960; Pavlov, 1927). Another mode of acquiring fears according to the learning theorists was direct instruction or information giving procedures, where a child is explicitly taught to fear certain harmful objects/elements, such as, fire or sharp objects.

Research based on the learning theories and conditioning principles soon led to the designing of behaviour therapy programmes for treatment of fears in children with autism (e.g., Lovaas, Schaeffer, & Simmons, 1965). Behaviour therapy programmes that used the principles of positive and negative reinforcement, and graded exposure have been variably used for reduction of frequency and intensity of fears experienced by children with autism. For example, a 14 year old girl in Florida was successfully treated for her phobia of swimming pools by using reinforcement and structured guidance procedures (Rapp et al., 2005). Another study by Gillis, Natof and Lockshin (2009) showed a reduction in fear-related behaviour in 83% of their sample consisting of 14 children with autism by using modelling and graded exposure techniques with the help of parents. The small sample sizes of these studies could arguably restrict the extent to which their findings can be generalised to a larger group of children with autism. Such behaviour therapy programmes were largely based on the principles of learning and conditioning theories.

The learning theories were however argued to be limited in their scope for treatment of fears and anxiety and it was identified that the role of conditioning in predicting fears might have been overemphasised, as these two are not always related (Mischel, 1973; Seligman & Johnston, 1973). In response to such criticisms, these theories were broadened by Rachman (1976, 1977), who emphasised the importance

of indirect cognitive underpinnings in contrast to more direct processes, such as, conditioning, instructional, or information transmission modes for the development and maintenance of human fear reactions.

The underpinning principle of cognitive theories is that a faulty interpretation of events causes excessive fear and anxiety in harmless situations (Clark, 1986; Clark & Beck, 1999; Clark & Steer, 1996; Clark & Wells, 1995). Specifically, according to cognitive theories of fear, a child's belief about the nature of fear objects, their own ability to deal with them, associated responsibility and anticipated outcome predicts the development and maintenance of fears, and the symptoms of anxiety (Beck, 1976; Beck & Emery, 1985; Rachman, 1978; Salkovskis, 1989). Indeed, cognitive behaviour therapy programmes (CBT) have been used for treatment of excessive and unusual fears or anxiety in children with autism (e.g., Chalfant, Rapee, & Carroll, 2007; Reaven, Blakeley-Smith, & Nicholas, et al., 2009; Wood, Drahota, & Sze et al., 2009; for a review see White, Albano, & Johnson, 2010). Current CBT programmes designed for reducing the occurrence of fears and anxiety in children with autism (especially those with $IQ > 70$, *i.e.* HFASD) aim to correct the faulty thought patterns related to responsibility, relevance and the belief in their ability to deal with a negative social situation.

Research studies have shown that children with high-functioning autism who qualified for the diagnosis of clinical level of anxiety disorder according to the *DSM-IV* at the start of a study, did not qualify for the same diagnosis after going through such intervention procedures (e.g., White, Albano, Johnson et al., 2010; Wood, Drahota, Sze et al., 2009). While these intervention studies have demonstrated that a reduction in the anxiety symptoms of children with autism can be achieved, their fo-

cus is on bringing about a change in the specific situations that were causing concern, rather than on the broader conceptual issue of, which cognitions might be contributing to a high occurrence of anxiety and fear in this population. The latter is the focus of the present study, in particular, investigation of that set of cognitions known as appraisals in children with autism, which have been consistently shown to be associated with fears and anxiety in other populations without autism.

3.3 Appraisal dimensions and structural model of appraisal

Appraisal theory fits broadly into a cognitive-motivational-relational theory of emotions (Lazarus, 1982). Here, the term ‘cognitive’ refers to knowledge and appraisal of social information, ‘motivational’ refers to personal motives that influence appraisals and ‘relational’ signifies that emotions are a product of the person-environment relationship. A basic premise is that an individual’s reactions to the same stimulus will vary depending on their motives, knowledge base and the unique ways of appraising. Lazarus further suggested that a personal meaning-based evaluation in terms of relative harm or benefits from a social situation is essential for any emotional feeling to be experienced. Lazarus and Folkman (1987) also emphasised that each situation is evaluated with respect to one’s desires, motives, values and goals; and based on this very personal meaning-based evaluation, an emotional feeling is experienced. The same situation can therefore have different meanings for different individuals because of a difference in their motives and can produce very different emotional responses at the feeling level.

Smith and Lazarus (1993) proposed a structural model of appraisal and emotion. This model included seven distinct appraisal dimensions. They showed that the seven appraisal dimensions could be reliably grouped into the two categories of primary

and secondary dimensions. According to their theory, primary appraisal dimensions involve an appraisal of the nature of a situation, in terms of its harm or benefit. On the other hand, secondary appraisal dimensions were proposed to be used for the purpose of assessing one's own resources and the abilities to deal with a confronting situation. Primary appraisal dimensions were proposed to be 'motivational relevance', which refers to how relevant a situation is to one's motives, goals and needs; and 'motivational incongruence', which poses the question of how comfortable or desirable a situation is.

Five secondary appraisal dimensions are 'self-accountability', 'other-accountability', 'emotion-focused coping potential', 'problem-focused coping potential' and 'future expectancy'. Self-accountability dimension involves an assessment of how much responsibility an individual takes for a confronting situation, while other-accountability estimates how much blame can be attributed to other people. Smith and Lazarus (1993) further proposed that people engage in an assessment of their ability to change or influence incongruent situations and their ability to deal with them emotionally. These were referred to as secondary appraisal dimensions of 'problem-focused coping potential' and 'emotion-focused coping potential', respectively. Finally, future expectancy poses the question of how certain a person can be about, whether an outcome will be favourable or unfavourable in a given situation.

According to this appraisal model, each situation is evaluated against each of the seven appraisal dimensions, which then determine a person's emotional reaction. This evaluation along the seven appraisal dimensions was also proposed to be contingent upon one's goals, abilities and motives. Thus, the same situation will be

appraised differently by different individuals. The primary appraisal dimensions are proposed to be essential to any emotional experience, but it is the unique secondary appraisal dimension that distinguishes one emotion from another. Smith and Lazarus (1993) elaborated on the role of the primary appraisal dimensions by proposing that if a person appraises a situation as motivationally relevant but incongruent, a negative emotion (e.g., fear, anger) is experienced. On the other hand, if a situation is appraised as motivationally relevant and congruent, a positive emotion results (e.g., happiness, pride). For example, for fear, low emotion-focused coping potential is the unique underlying secondary appraisal dimension. If instead of low emotion-focused coping potential, other-accountability merges with motivational relevance and incongruence, the outcome would be the emotional experience of anger. Other research studies too have shown an association between specific appraisal dimensions and fears/anxieties, albeit in groups of children without autism, such as, children experiencing inter-parental conflict (Gerard, Buehler, & Franck et al., 2005), parental divorce (Grych, Harold, & Miles, 2003), and children from battered women's shelters (Grych, Fincham, & Jouriles et al., 2000).

3.4 Association of appraisals with fear and anxiety

Studies such as those by McDonald and Grych (2006), Gerard et al. (2005) and by Grych and colleagues (Grych & Fincham, 1993; Grych et al., 2003; Grych et al., 2000), carried out with children from families characterised by inter-parental conflict, or parental divorce showed evidence for an association between cognitive elements of self-blame, threat and coping potential with anxiety, and related adjustment difficulties. These cognitive elements, whereby an evaluation of

situations for their relative harm or benefit, in relation to oneself, results in either positive or negative thoughts or affect are similar to cognitive appraisal dimensions.

An illustrative summary of studies that investigated association of cognitive appraisals with fear and anxiety in groups of children without autism is shown in Table 3.1. The studies include children from families experiencing conflict, violence or breakdown^{1, 4, 5, 8, 9, 10}, children from battered women's shelter (Grych et al., 2000) and also TD children. Despite assessing children experiencing quite different vulnerabilities and using different assessment scales, all these studies found that the appraisals of self-blame (*i.e.* self-accountability) and threat (*i.e.* coping potential) were associated with fear and anxiety in groups of children without autism.

Studies shown in Table 3.1 used hypothetical conflict vignettes^{1, 3} or technique of narrative recall² for an assessment of appraisal dimensions. However, these studies differed from each other in the terminology used for appraisal dimensions and the respective scales employed for measuring appraisals. For example, in five studies^{4, 5, 6, 8, 9}, appraisals of self-blame and threat were assessed using the Children's Perceptions of Inter-parental Conflict scale (CPIC: Grych, Seid and Fincham, 1992). The CPIC consists of two sub-scales for different appraisals: a 12-item threat scale and a 9-item self-blame scale. Self-blame has been associated with anxiety in other studies too that used different measures. Another study² used the 'What I Felt' scale', which again like the CPIC consisted of specific items to assess the underlying thoughts and cognitive elements.

Table 3.1

Association of appraisals with anxiety in children from vulnerable backgrounds

Authors	Sample: N & age (years)	Scale for measuring appraisal	Findings
1. Grych & Fincham (1993)	Study 1: 45 (11-12 years); Study 2: 112 (12)	Vignettes and specific items for assessing appraisals	Appraisals of self-blame and threat were associated with negative affect
2. Sheets, Sandler, & West (1996)	254 children 8-12 years	Recall of past situation and WIF	Negative appraisals such as self-blame predicted anxiety
3. Graham & Juoven (1998)	418 children-mean age= 12.4 years	Hypothetical vignettes and questionnaire	Perceived appraisals of self-blame associated with anxiety
4. Kerig (1998)	174 children (7-11 years)	CPIC scale	Appraisals of self-blame, threat and coping potential positively associated with anxiety
5. Kerig (1998a)	106 children (8-11 years)	CPIC scale	Appraisals of self-blame, threat positively associated with anxiety
6. Grych et al. (2000)	145 children battered women's & 317 TD children (10-14 years)	CPIC scale	Appraisals of threat and self-blame associated with internalising problems such as anxiety in children
7. Smari et al. (2001)	184; 14-15 years	Appraisal inventory	Appraisals related to the likelihood of negative outcome and cost of negative social events predicted social anxiety.
8. Grych et al. (2003)	298 children 11-12 years	CPIC scale	Appraisals of threat and self-blame were associated with anxiety and adjustment

Authors	Sample: N & age (years)	Scale for measuring appraisal	Findings
9. Gerard et al. (2005)	1893 children 10-14 years	CPIC	Perceived threat and self-blame mediators of the relationship between conflict and anxiety.
10. McDonald & Grych (2006)	184; 7-9 years	CPIC	Appraisals of self-blame and threat mediated the relationship between inter-parental conflict and internalising problems such as anxiety

Note: CPIC: Children's Perceptions of Interparental Conflict (Grych et al., 1992); WIF:

What I Felt Scale (Sheets et al., 1996)

The sub-scale for assessing self-blame in these studies consisted of items, such as, 'I am responsible for this negative situation' and the sub-scale for threat consisted of items, such as, 'I was not sure how to deal with this situation' or that 'I felt uncertain'. Thus, by definition, self-blame can be argued to be conceptually similar to secondary appraisal dimension of self-accountability and threat to be similar to coping potential in the structural appraisal model. In these studies, threat and self-blame were found to be predictive of anxiety in children, in such a manner that with increases in these two appraisals of self-blame and threat, anxiety increased. So, it is possible that the appraisal dimensions of self-accountability and coping potential might be associated with fear in children with autism as well. Another study⁷ used an appraisal inventory for the assessment of situational appraisals. They presented 10 social and non-social aversive events to the participants and assessed their response to each situation using single-items designed to assess the likelihood for bad social events, likelihood for general negative events, cost of negative social events, and the cost of general negative events. 'Likelihood' here referred to the expectancies about future, 'cost'

meant personal relevance and coping potential to deal with a negative situation. Once again by definition, cognition of 'likelihood' is comparable to the appraisal dimension of future expectancy, and 'cost' to appraisals of motivational relevance and coping potential. Their study found that negative appraisals relating to the likelihood and cost of that specific negative situation predicted social anxiety in the TD group of their study. Appraisals of future expectancy and coping potential might thus be associated with anxiety.

Studies with TD populations (e.g., Smith & Ellsworth, 1985) and cognitive theories of anxiety disorders in children and adults have emphasised the prime role of impaired thoughts, such as, inflated responsibility, low coping potential and future expectancies in causing excessive anxiety (Salkovskis, 1985; Thorpe & Salkovskis, 1995). These studies highlight an association between cognitions related to low future anticipation, excessive self-responsibility and uncertainty about the ways of dealing with negative consequences of a social situation with anxiety and adjustment difficulties. Drawing on these findings, could children with HFASD, a group known to experience excessive negative emotions and social difficulties, also experience similar deficits in appraisal? Could association of appraisals with negative emotions be significant in this group, too?

Our literature search on the electronic databases of Omnifile, PsyInfo and ScienceDirect using different combinations of the search terms of fear, anxiety*, autism*, Asperger and cogniti*, and for studies carried out between the years 1994-2010, revealed only one previous empirical research that investigated cognitions in relation to anxiety in an autism group. This study by Farrugia and Hudson (2006) included 29 adolescents with AS, 30 with anxiety disorder and 30 TD controls. It

found significantly higher scores for anxiety and negative thoughts in the AS group than in the anxiety disordered and TD groups. A significantly higher association was also found between anxiety symptoms and negative cognitions assessed through the Children's Automatic Thought Scale (Scheiring & Rapee, 2004) that consisted of items such as, 'I will never overcome my problems', 'Something awful is going to happen', 'There is something very wrong with me', etc. So, children's beliefs about the nature of fear objects, their perception of their ability to deal with them, associated responsibility and anticipated outcome were associated with the symptoms of anxiety. These cognitions may be considered to be similar to the appraisal dimensions of self-accountability, future expectancy and coping potential, proposed by Smith and Lazarus (1993); the latter have already been shown to be associated with negative emotions and anxiety disorders. An investigation of cognitive appraisals could therefore be important in furthering our understanding of fears and anxiety in children with HFASD. Cognitive appraisals have not been investigated in children with HFASD. Instead, the theory-of-mind (TOM) deficit account is a more commonly advanced explanation for anxiety and social difficulties in this group (e.g., Baron-Cohen, Jollive, Mortimore, & Robertson, 1997; Frith, Happé, & Siddons, 1994).

3.5 TOM deficits in children with autism

TOM refers to the ability to understand the intentions and perspectives of another person in a social situation (Premack & Woodruff, 1978); this has been very influential in explaining impairment in primarily three areas of functioning: socialisation, imagination and communication (Frith & Happé, 1995). Pioneering work in TOM ability of children with autism included a research study by Baron-

Cohen, Leslie and Frith (1985), who aimed to assess basic TOM ability in children with autism using the Sally-Anne task designed by Wimmer and Perner (1983). This study by Baron-Cohen et al. showed that the groups of typically developing 4 year olds and children with Down Syndrome could pass this test, but 80% of older children with autism failed. It was therefore argued that TOM ability may be impaired in children with autism and be responsible for the commonly seen social deficits in children with autism. Replications of this study indicated that TOM ability might not be universal to all children with autism (e.g., Frith, 1989; Frith & Happè, 1995; Leslie, 1987, 1988; Perner, Frith, Leslie, & Leekam, 1989) as many children could pass TOM tasks. As another critique of Baron-Cohen's theory, Ozonoff et al. (1991) found that when children with autism were matched with a TD sample on the scores for verbal IQ, there was no difference between the two groups on more advanced TOM tasks. Similarly, Bowler (1992) found that more than 70% of adults with HFA could pass an advanced and more complex TOM task. In light of such criticisms, and further research by Baron-Cohen (1989), their original propositions were revised to suggest a delay in the acquisition of TOM ability, instead of a complete absence in children with autism. So, to summarise, research in the area of TOM ability has shown mixed findings, suggesting only a mild deficit in advanced TOM ability.

In the case of children with autism, TOM ability is also known to be associated with psychological and social functioning in children and adults with autism across the spectrum (e.g., Blackshaw, Kinderman, Hare, & Hatton, 2001; Brent, Rios, Happé, & Charman, 2004). It is however argued here that the TOM deficit account is limited in its scope for fully understanding the nature of affective disorders in

children with autism. In this context, it is useful to highlight a distinction between two important cognitions of knowledge and appraisals proposed by Lazarus and Smith (1988). TOM deficits imply a state of uncertainty with regards to the knowledge of another person's thoughts in a social situation, while knowledge contributes to appraisals; it is appraisals that are a crucial determinant of emotions (Lazarus, 1991). It can thus be argued that a deficit in TOM ability focuses on an individual's *knowledge* of a situation, a deficit in which might reduce the clarity, increase ambiguity (López, & Leekam, 2003) and interfere with *appraisal* of that situation, in terms of their own goals, needs and beliefs. A lack of understanding in a social situation might thus occur due to TOM deficits. So, it is proposed that TOM ability might be linked to cognitive appraisals in children with autism.

3.6 Theory-of-mind and appraisals in children with autism

TOM deficits imply a state of uncertainty with regards to another person's thoughts in a social situation, when the clarity will be reduced and ambiguity increased (Frith & Happè, 1995). The term ambiguity implies that the meaning of a person's thoughts cannot be derived from its context. When the clarity of relevant information in a situation is lacking, a child may have to rely on his/her past experiences for making judgements or inferring meaning out of a situation (Crick & Dodge, 1994; Lazarus & Folkman, 1984). So, ambiguity in a situation will have an effect on the social cognitive processes. For example, using hypothetical provocation vignettes, Dodge and Tomlin (1987) showed that aggressive children in their study inferred hostile intent to the central character in situations, which were actually ambiguous in nature. Other studies (e.g., Dodge & Newman, 1981; Gouze, 1987; Strassburg & Dodge, 1987), too, have shown that in ambiguous provocation

situations, children who are aggressive by nature tend to attribute hostile intent to the situations. Focus of the current research however is fear, not aggression, as children with autism are known to exhibit excessive anxiety in social situations. It is however possible that a social situation which might appear ambiguous because of TOM deficits might as well be interpreted as threatening.

Archer (1979) tested the effect of trait anxiety on cognitive appraisals, such as expectancy about the outcome and general coping potential. He measured expectancy of the outcome of two groups of participants (one high in trait anxiety and other low in trait anxiety), in three experimental conditions: two of which were unambiguous and one was ambiguous. It was found that in the unambiguous situations, there was no significant difference between the two groups in their appraisals related to the expectancies and coping potential. However, in the ambiguous situation, the low trait anxiety group reported a significantly higher appraised coping potential in being able to avoid shock and a more positive appraisal of expectancy about the outcome, compared to the high trait anxiety group. Another study by Amin, Foa and Coles (1998) presented 22 ambiguous vignettes to groups of 32 individuals with generalised social phobia and 15 non-anxious control adults. Each scenario was followed by three possible interpretations: negative, positive and neutral; and the participants were asked to rank order three interpretations for each scenario. The group with generalised social phobia gave a greater number of first rankings to the negative interpretation than did the control group. Similarly, a study by Constans, Penn, Ihen and Hope (1999) showed a negative interpretation bias amongst high anxious undergraduates compared to low anxious students in response to ambiguous interpersonal events. Ambiguity arising due to TOM deficits in children with autism

in social situations might therefore influence appraisal dimensions in such a manner that with an increase in ambiguity, the appraisals related to coping potential and expectancies decrease. TOM ability might thus be associated with appraisal dimensions: this will be investigated in Study 1.

3.7 Technique of systematic manipulation in assessment of appraisals

A common technique in the study of cognitive appraisals has been the manipulation of factors associated with appraisals across different versions of a hypothetical story/situation. Previously, researchers have engaged in systematic manipulations of participants' thoughts (Smith & Lazarus, 1993), action tendencies (Frijda, Kuipers, & ter Schure, 1989) or even emotional states (Lazarus, 1991), in order to assess the effect of such manipulations on cognitive appraisals. For example, in the study by Smith and Lazarus (1993), described above in Section 3.3, four versions of a hypothetical story were designed through systematic manipulation of the participants' thoughts related to other-accountability, expectancy about the outcome, perceived coping potential etc. Participants' appraisals were assessed in each of the four conditions. Similarly, as described above in Section 3.6, the effect of ambiguity on appraisals through the designing of high and low ambiguous versions of hypothetical vignettes have also been investigated (e.g., Amin et al., 1998). Other studies employed analogous control manipulation techniques (e.g., Lazarus & Alfert, 1964; Geen, Stonner, & Kelly, 1974; Holmes & Houston, 1974), which were successful in producing desired changes in thoughts and even the consequent emotional behaviour of an individual. So, the technique of manipulating selected cognitions that might be associated with cognitive appraisals has been commonly

used; and has also been shown to be successful in producing systematic changes in cognitive appraisals.

One such factor known to be associated with cognitive appraisals is emotional action readiness, which can be manipulated to either prepare participants to advance or retreat in a social situation (De Rivera, 1977; Scherer, 1984). State of emotional action readiness related to *preparing to advance* is known to be associated with the appraisals of increased coping potential and positive expectancy about the outcome. On the other hand, if emotional action readiness state of *preparing to retreat* is emphasised in a situation, appraised coping potential and expectancy about the outcome might be lower (Frijda et al., 1989). Responses to an appraisal questionnaire in *advance* and *retreat* emotional action readiness conditions will thus be examined in Study 1.

3.8 Hypotheses and research questions for Study 1

On the basis of above arguments, specific hypotheses and research questions for Study 1 are:

Hypotheses replicated from previous research

1. The HFASD group will have higher mean values for fear and anxiety compared to TD group.
2. The HFASD group will have lower scores for TOM ability than TD group.

New hypotheses for Study 1

3. The HFASD and the TD groups will have significantly different scores for the appraisal dimensions of motivational relevance, motivational incongruence, self-

accountability, problem-focused coping potential, emotion-focused coping potential and future expectancy.

4. Six appraisal dimensions will be significantly associated with fear and anxiety in the HFASD and TD groups. Specifically, association between the appraisal dimensions of motivational relevance, motivational incongruence and self-accountability with fear and anxiety will be positive. A negative correlation will however be obtained for association for fear and anxiety with the other three appraisal dimensions of future expectancy, emotion-focused coping potential and problem-focused coping potential, in the case of both the HFASD and TD groups.

Exploratory research questions

1. Do scores for the appraisal dimensions of self-accountability, future expectancy, emotion-focused coping potential and problem-focused coping potential differ between the three action readiness conditions of: *no action readiness*, *preparing to advance* and *preparing to retreat* conditions in the HFASD and TD groups?
2. Are the three constructs of TOM ability assessed through the technique of Strange Stories (Happé, 1994): the ability to correctly infer the truthfulness of a non-literal utterance in a story, ability to correctly explain the non-literal utterance, and the ability to correctly infer mental states of the characters in a story associated with the primary/secondary appraisal dimensions in the HFASD and TD groups?

3.9 Summary

The evidence discussed above highlights an association of the symptoms of anxiety with cognitive appraisals in children without autism. Rather than cognitive appraisals, the TOM deficit account is common for explaining the occurrence of

related social-emotional difficulties in children with autism. This chapter proposed a possible link between TOM ability and appraisals in children with HFASD.

Cognitive appraisals and their study in relation to *emotional action readiness levels* were also argued to be of relevance, while examining fears and anxiety in children with autism. It is proposed that studying appraisal dimensions will provide useful insights about which cognitions are associated with fear and anxiety in children with HFASD.

Chapter 4: Methodology Study 1

4.1 Introduction

This chapter will outline how families with either a child with HFASD or TD were first identified and how were they then contacted to request their participation in Study 1. This chapter will also outline a description of the scales used, which included self-report scales, interview schedules and imagery techniques. Preliminary analyses to check data characteristics will also be reported.

4.2 Participants and selection procedures

Participants for Study 1 were a group of children with HFASD and a control group of TD children. To start the recruitment process, a general search on the website: www.google.co.uk was carried out to search for the services working for or with children with autism in the UK. Before contacting any organisation with a request for help with the recruitment, ethics approval from the University ethics committee was obtained (Reference number: UEC0607/36). A total of 400 participant packs were sent to these organisations. A list of 100 organisations was obtained from this and an email request and the same letter by post were sent to these organisations to ask for their help with the recruitment of participants in the HFASD and TD groups. In the case of the organisations only attended by children with HFASD, a request for the recruitment of only children with HFASD was sent (the sources of recruitment for each group are stated in Section 4.2.3). Participant pack consisted of a participant information sheet for parents (different sheets for the HFASD and TD groups - see Appendices 1 and 2), a separate sheet for children (different for the HFASD group and TD groups - see Appendices 3 and 4), consent forms for children and parents

(see Appendices 5 and 6) and a self-addressed stamped envelope. One programme run by the National Autistic Society (NAS), two psychiatrists, three autism research centres and 10 mainstream schools with special units agreed to help with the recruitment process.

4.2.1 Inclusion criteria: the following inclusion criteria were used for the recruitment of participants:

- Children with HFASD should be aged between 8-12 years of age and have received the formal diagnosis of AS or HFA that also implied an average IQ.
- Typically developing children should be aged between 8-12 years of age and have no diagnosis of any kind of developmental delays; and should be attending a mainstream school.

4.2.2 Power analyses and sample size calculations: Data were initially collected from 30 children with HFASD and 30 TD children. However, after testing for normality, data from three participants were omitted (for a fuller description see Section 4.7.1), resulting in a total sample of 29 children with HFASD and 28 TD children. Power analyses on the GPOWER (Erdfelder, Faul & Buchner, 1996) software showed that an effect size of .8, p value of .05 and power of .80 could be achieved by a total sample size of 44 for t -tests, a sample size of only 8 for correlation analysis and a sample consisting of 16 participants for a-priori mixed ANOVA analyses with two groups. The total sample size of 29 in HFASD and 28 in TD groups in Study 1 was thus considered sufficient.

4.3 Sources of recruitment

Main sources of recruitment for both the groups of children were: the National Autistic Society (for the recruitment of children in the HFASD group), National Health Service (for children in the HFASD group), schools with special units in Scotland (for children in both the HFASD and TD groups), voluntary parent support groups in England and Scotland (for children in the HFASD group) and the Hindu temple in Glasgow (for children in the TD group).

4.3.1 National Autistic Society (NAS): Once ethics permission was obtained from the ethics committee of the NAS, 125 participant packs were sent out by a manager of the NAS help! program to families in their database. In order to ensure confidentiality, contact details of the families were not provided to the researcher. All the packs had a stamped addressed envelope for return to the researcher. Participant information sheets (see Appendices 1-4) informed the participant parents and children of the objectives of the current research and the details of what they would be expected to do, if they decided to participate, as well as information about confidentiality of their personal information; and their right to withdraw from the research at any time. The participant information sheet for parents also included a written request to sign and send back the consent forms (see Appendices 5-6) with their home address and telephone number, if they chose to participate, in order for the researcher to contact them and arrange a time for testing. The information sheets for parents also provided the researcher's contact details to allow parents to ask questions or raise concerns, if any. An advertisement requesting participation of families with a child with HFASD was also put up on the website of NAS. Twelve children with HFASD were recruited through the NAS.

4.3.2 NHS (National Health Service): Local NHS psychiatrists working with children with HFASD were sent the request for help with recruitment. Two psychiatrists in the Greater Glasgow and Clyde area agreed to send the participant pack to families with a child with HFASD from their open case list. An application was made to the local NHS ethics committee and the necessary permission was obtained (REC Ref. no. 07/S0701/131); the applicant was the researcher. Twenty five participant packs were sent to the families with a child with HFASD through two psychiatric centres in the NHS. One child with HFASD was recruited via this means.

4.3.3 Schools in Glasgow and surrounding areas: The permission to contact mainstream schools and special units for the recruitment of children for both the HFASD and TD groups were obtained from the Glasgow City Council (Ref. JS/Rsrch), Renfrewshire Council (Ref. PH/SG), North Lanarkshire Council (no reference number provided), and the Edinburgh Council (Ref. QD19). Over 50 schools in Glasgow, Renfrewshire, Lanarkshire and Edinburgh were contacted by email and post to inform them of the purpose of Study 1 and to request their participation. Meetings with the head teachers took place in 20 mainstream schools with special units in Glasgow, four schools in Renfrewshire, one in Lanarkshire and two in Edinburgh to explain the aims and procedures of the current study. All the schools visited, except for two in Glasgow, agreed to send out the participant packs to families of TD children and children with HFASD in their schools on the researcher's behalf.

A total of 75 packs were sent to families of TD children and 35 were sent to families with a child with HFASD. Some schools preferred the families to send the

consent forms back with their child to the school and then school staff to inform the researcher, of the families who were willing to participate (signed consent forms were later handed over to the researcher), while others simply forwarded the participant packs and allowed the interested parents to get in touch with the researcher directly. One school in Glasgow and one in Renfrewshire expressed concerns about parents having to travel to the University for the testing and thus allowed the testing to be carried out at the school premises. Six children with HFASD and two TD children were recruited through schools in Glasgow and Renfrewshire.

4.3.4 Parent Support Groups: Parent support groups within the NAS in Scotland and England were contacted through email. Contact information for these was found through the general web search on the website of www.google.co.uk. In total, 10 subsidiary NAS organisations were contacted through post and email for help with the recruitment process. With the letter, a flier to advertise the call for participants was also enclosed and they were requested to place it on their notice board for visitors. Most subsidiary organisations only had 3-5 children with HFASD. Two organisations, the Scottish Autism Network Society and the Sleep Scotland also published the call for participants on their webpage. Other support groups agreed to post the advertisement on hard board in their reception area. Two children with HFASD were recruited through this means.

4.3.5 Hindu temple: A flier calling for participants was pinned on the common notice board of the Hindu temple reception area in Glasgow. Eight TD children were recruited and were tested in the meeting room of the temple. As children from a particular ethnic group might be considered atypical, an additional study was carried

out to determine whether this was a source of bias (see Section 4.4 below and Appendix 7).

4.3.6 University of Strathclyde campus: Advertisements inviting participants (parents of children in both the HFASD and TD groups) for Study 1 were posted across all the Faculties of the University of Strathclyde and a call for participants was also published on the internal website (PEGASUS) of the University of Strathclyde for staff members, researchers and students. Ten TD children were recruited through this means.

Information on the specific number of participants in the HFASD and TD groups from the six different sources of recruitment, discussed in Sections 4.3.1-4.3.6 is summarised in a flow chart below.

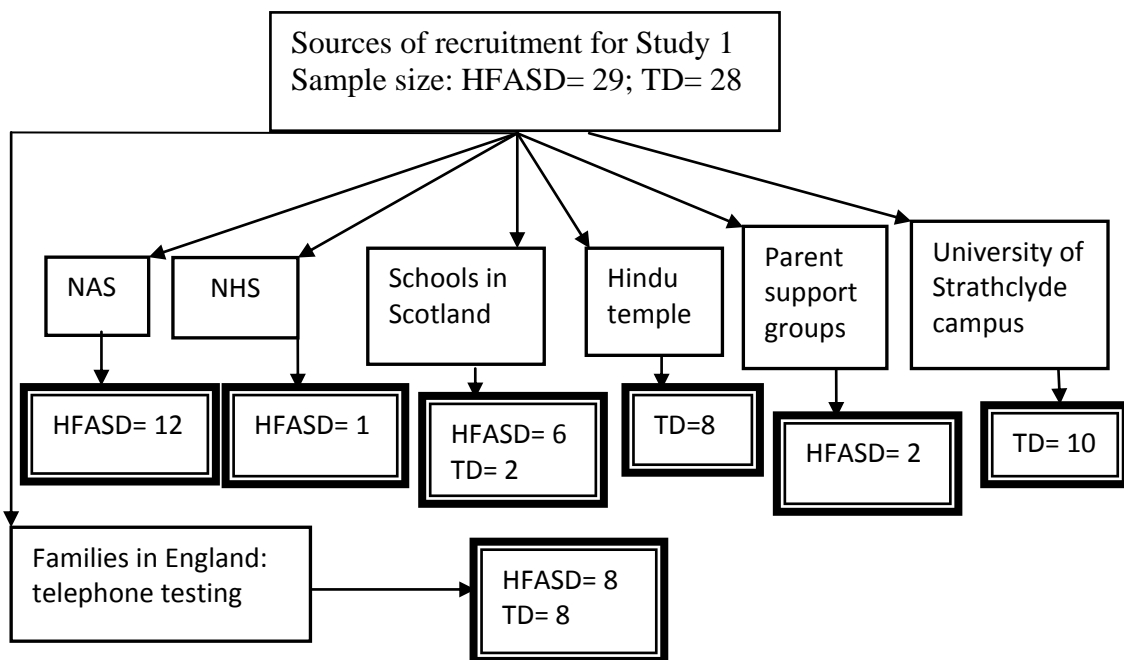


Figure 4.1: Breakdown of the number of participants recruited from the six sources

As can be noted in Figure 4.1, intake rates in the response to the request for participation were not high, nevertheless, as indicated by the power size calculations

in Section 4.2.2, the sample size of 29 children in the HFASD group and 28 in the TD group was considered sufficient for the analyses strategies planned for Study 1, which consisted of *t*-tests, correlations and ANOVA analyses.

4.4 Testing via telephone

Some parents living in distant parts of the UK offered their participation, but expressed concerns about coming to the University for testing because of the time and expense involved in travelling. Although, more than 500 families with a child with HFASD and more than 300 families of TD children were contacted through many sources, only 20-21 local families had agreed to participate in the research. There was therefore, a need to access those participants who were not local and the possible alternatives to face-face testing were sending of questionnaires through post, uploading online or administering it through telephone. It was discussed that the researcher could have maximum control over the administration of standardised questionnaires through telephone testing, since the only difference from face-to-face testing mode would be that the researcher would be asking questions by telephone and the remaining conditions of: one-to-one testing in a quiet room with the parent in the same room available to answer queries, if any, would remain the same. It was thus decided to collect data from the long-distance participants by telephone with the help of parents who would be in the same room as their child. Data from eight children in the HFASD group and eight in the TD group were collected by telephone. It was acknowledged that such testing with the researcher on telephone was a non-standard procedure and could potentially elicit different responses as compared to face-to-face testing.

In order to justify this non-standard telephone data collection technique and also to assess the possible bias from the inclusion of an ethnic minority group of Hindu children in the TD group (see Section 4.3.5), an additional study was carried out (see Appendix 7). Before embarking on this new data collection, necessary ethics approval was obtained from the University Ethics Committee and a small sample of 16 children was recruited (consisting of 8 TD children and 8 children with HFASD). This sample size was considered adequate for carrying out correlation analyses (Erdfelder, Faul & Buchner, 1996; for the description of sample size analyses see Section 7.5 in Appendix 7). The aim was to test for the degree of similarity between the face-to-face and telephone administration; and also determine whether there was a significant difference between the Hindu and non-Hindu respondents (for a fuller description see Appendix 7).

Large, significant ($p \leq .05$) correlations with coefficients ranging from .66 to .98 were found between the face-to-face and telephone testing modes (see the findings for Study 1 in Table 3, Appendix 7) for the key variables of: appraisal dimensions of self-accountability, emotion-focused coping potential, future expectancy, negative affect of fear and vocabulary sub-test of the WISC-IV scale, in both the HFASD and TD groups. However, in the HFASD group, the appraisal of problem-focused coping potential showed a small correlation that was not significant. All the correlations were also large and significant for the TD group (see the findings in Table 3, Appendix 7). Furthermore, a Mann-Whitney U test found no significant differences between data collected from the Hindu children assessed during Study 1 and the non-Hindu children assessed during the additional study (see the findings in Table 4, Appendix 7); this was true for the variables of self-accountability, problem-focused

coping potential, emotion-focused coping potential, future expectancy and fear in both the groups.

These large correlations between data obtained through the face-to-face and telephone testing modes; and non-significant Mann-Whitney output for the differences in data collected through the Hindu and non-Hindu children suggested that data collected through the non-standard telephone testing and from atypical sample of Hindu children may not be a source of bias for any of the variables, other than possibly for the appraisal dimension of problem-focused coping potential. In the case of the appraisal of problem-focused coping potential, difference between the face-to-face and telephone testing modes was also found to be non-significant. This suggests that data from the two modes of testing did not differ significantly. However, since the correlation output was found to be non-significant, data from the face-to-face and telephone testing session modes may not be completely identical; so the findings related to problem-focused coping potential will be interpreted with a certain degree of caution.

4.5 Rights and security of participants' information

The study objectives and procedures were explained to all the parents and children, and they were informed that their interview responses would be audio recorded. They were assured that their participation was voluntary, and that they could withdraw at any time of the study. They were also informed that information obtained from them would be treated in confidence and be destroyed after the study was complete. Signed consents were obtained from all the children and parents on a paper copy of the consent form. For testing on the telephone mode, participants were sent hard copies of all the questionnaires with instructions along with a stamped

addressed envelope. Data were anonymised and separate code sheets containing confidential background information about the participants were stored separately for the purpose of analysis. Data were later transferred to SPSS (2009) and were stored on a password protected University computer.

4.6 Measures and procedure

A combination of standardised self-report scales, questionnaires, interviews and hypothetical vignette was used. For all self-report scales, children were asked if they wanted the questions to be read aloud or if they preferred to read themselves. To keep the administration method consistent across participants, scales were presented in a fixed order to all the children: first ‘Strange Stories’ scale, next hypothetical frustrating vignette followed by ‘Spence Children’s Anxiety Scale’ and finally ‘vocabulary sub-test of the WISC-IV scale’ administered to children and the ‘Childhood Asperger Syndrome Test’ scale was given to the parent. A few weeks before embarking on data collection through these techniques, a small group of 14 children with HFASD and 12 TD children were administered the technique of ‘narrative descriptions’, which then guided the formulation of stories for the ‘hypothetical frustrating vignette’ technique. The same group of children then continued their participation in the rest of Study 1 and once data collection was in progress, subsequently more children were recruited to result in the total sample size of 29 children with HFASD and 28 TD children in Study 1 (the recruitment procedures are described above). Children were tested individually in a quiet room.

4.6.1 Narrative Descriptions (guided the formulation of scenarios for the hypothetical frustrating vignette): Personal accounts of past frustrating emotional experiences of children were elicited through the use of a procedure called ‘narrative

descriptions'. A similar technique has previously been used by Losh and Capps (2003) with a group of children with autism. Children were asked to recount an experience from the past two weeks, when they felt frustrated (see Appendix 9). An explanation of the word *frustrated* was given to ensure that children understood nature of the task correctly. In order to facilitate the recall process and make it enjoyable for children, they were told:

"I will ask a number of questions about your past emotional experiences and your responses will be audio recorded. Answer the questions as if you are talking to an alien (a prompt was provided if required), who though is a brilliant being but has no first-hand experience of the human emotions, and thus eager to learn as much about emotional behaviour as possible. Recall a past emotional experience or event in which you have felt frustrated (prompt if required). Picture this situation in your mind. Try and remember as vividly as you can what this past frustrating situation was like. Think of what happened to make you feel frustrated and what it felt like to be frustrated in this particular situation. Tell me when you are ready and have this frustrating situation in mind, and I will ask you questions about it. Remember you are telling this to an alien who never had any frustrating experience, what one was like."

When the participants said they were ready, questions were asked about their experience:

"Please describe this frustrating situation to me". "What was it like to be frustrated in this situation?", "What happened in this situation to make you feel frustrated?", "Why did these things make you feel frustrated?"

This procedure usually took less than 10 minutes. The responses were audio recorded for transcription. The transcribed responses were analysed through thematic analysis (Braun & Clarke, 2006) to identify what situations seemed frustrating to children in the HFASD and TD groups and whether there were any differences or similarities between these two groups. Results from this analysis guided the formulation of vignettes for the technique of 'hypothetical frustrating scenarios',

which were used in the assessment of appraisals and fear, as explained below in Section 4.6.3.

4.6.2 Strange Stories: To test TOM ability, the Strange Stories (Happé, 1994) scale was administered to children in the TD and HFASD groups (see Appendix 8), since it allows investigation of complex second order TOM ability. This has also been shown to be a more sophisticated tool for the assessment of TOM ability in children with autism compared to other measurement scales (Jolliffe & Baron-Cohen, 1999). Adaptation of this scale for Study 1 consisted of an inclusion of more detailed clipart pictures rather than the pencil sketches originally used by Happé. The pencil sketches used by Happé could be perceived as ambiguous by children with HFASD, since those figures were not clearly defined; thus clipart pictures were used to aid understanding of the stories by children with HFASD. An inter-rater reliability check was carried out to ensure that the pictures depicted the stories correctly. Ten non-psychologists read the stories and rated the clipart pictures on a 0-3 scale, as to how well they illustrated the story (0-not at all, 1-a little bit, 2- quite close, 3- absolutely depicting). All the ten raters gave a score of 3 to each of the 24 stories, so the pictures were considered as genuinely representative of all the stories.

This scale consisted of 24 short vignettes that represented naturalistic, complex everyday situations that included non-literal utterances by the central characters, *i.e.* subjects in story said something they didn't literally mean. Each of the 24 stories was accompanied by a picture and two or three questions. The first question checked story comprehension: "*Was it true what X (central character) said?*" The second question was a justification question (two questions in some vignettes), which asked "*Why did X say that?*", or "*Why didn't X say something else?*". The set of stories was

presented in a fixed order to all the participants. The children were asked to imagine being the central character in the stories and then to answer the questions following each of the 24 stories. Participants were told: *“Here are some stories and some questions. I am going to read out the stories and I would like you to listen carefully; and help me with the questions at the end of each story.”*

Most children could complete the stories in one testing session, but breaks were given as and when needed. Story and the accompanying picture remained in front of the children throughout the testing session to minimise memory requirements. The stories were read out aloud to children in almost every case. At the end of each story, each child was asked two (or sometimes three) test questions. If the first comprehension question (*“Was it true what X said?”*) was answered incorrectly, the answer was recorded, but the story was read out again to ensure that all children understood the story correctly. The second (and sometimes third) justification question was then asked and the children’s responses were re-coded in full on the scoring sheet for later analysis. No feedback about the accuracy of responses was provided, but positive comments were made throughout the testing session to maintain motivation. Since the administration of the stories varied according to individual needs with repetition at some places, total administration time varied from 20 to 45 minutes. Prompts were given only for the first comprehension question; however, if children answered the subsequent justification questions incorrectly, their first response was recorded without further explanation. Participants chose either to write their responses on their own on the response sheet, or to have the investigator record responses on their behalf.

The first comprehension question was scored as either 0 (incorrect) or 1 (correct) after providing two prompts in the case of incorrect responses. The justification (*why*) questions were given a score of 0 for incorrect responses, a score of 1 for correct, but incomplete responses and a score of 2 for correct and complete responses. The *why* questions were also scored for an indication of mental states in their responses; 0 was given for an incorrect inference of mental states, 1 was given when the inferred mental state was of first order and 2 was given for the second order mental state. A total of all the scores were calculated to obtain an overall TOM score. A total for just the comprehension questions were calculated for all the 24 stories to give a score for the children's ability to comprehend non-literal utterances in the 'Strange Stories'. A total score for the *why* questions were calculated separately to provide a measure of the children's ability to justify the non-literal utterances in the stories. Finally, a separate score on the children's ability to infer mental states of other people in the stories was also calculated.

Internal reliability of each of these sub-scales was assessed by calculating Cronbach's alpha for each of the three sub-scales of the 'Strange Stories', since such an analysis has been argued to reduce the probability for measurement errors (Blalock, 1970; Carmines, & Zeller, 1979). This was carried out to ensure that the multiple items intended to measure the same construct corresponding to one sub-scale are strongly correlated with each other (George & Mallery, 2003). This calculation was carried out through SPSS (2009) separately for each sub-scale and for each group. Value of Cronbach's alpha can vary from 0 to 1 and in order for the scores on a sub-scale to be reliable, the minimum value of Cronbach's alpha should be .7 (Gliem & Gliem, 2003). The sub-scale consisting of a total score of the

children's answer to the first comprehension question for the HFASD and TD groups was found to have a good internal reliability with a Cronbach's alpha value of .85 and .80, respectively. Similarly, reliability of the sub-scale that consisted of a total of the answers to the justification question was good with a Cronbach's alpha of .82 for the HFASD group and .86 for the TD group. Finally, the sub-scale that consisted of a sum of mental state indications in the children's responses also demonstrated good internal reliability: Cronbach's alpha was .85 for the HFASD group and .83 for the TD group. All the three sub-scales of the 'Strange Stories' test thus showed good internal reliability with this sample.

4.6.3 Hypothetical Frustrating Vignette: A similar technique was previously used by Smith and Lazarus (1993) to test the appraisal-emotion relationships in a group of TD participants. Previously, Smith and Lazarus designed hypothetical vignettes with three different stages featuring manipulation of selected cognitions and then engaged in systematic assessment of appraisals and emotions in each stage. This technique was utilised in Study 1 (see Appendix 10), but it should be emphasised that the assessment tool of 'hypothetical frustrating vignette' used in Study 1 is quite distinct from Smith and Lazarus's tool, as new stories were written (based on data collected from the administration of 'narrative descriptions'), clipart pictures were added and a different cognition of *perceived emotional action readiness* was selected for manipulation across the stages of the hypothetical vignette.

The appraisal questionnaire used by Smith and Lazarus (1993) was also utilised in the current study. This selected questionnaire was used in Study 1 because children with HFASD are known to exhibit comparable levels of IQ to typically developing groups and indeed, scored similar to the TD group on vocabulary sub-test of the

WISC-IV scale in the current study (see Section 5.2). So the slightly modified version of the appraisal questionnaire through simplification of language was considered appropriate for the participants of Study 1. Another reason for selecting the scale developed for an older, typically developing group was that most other standard appraisal questionnaires have been contextualised for specific groups of children with unique special needs or vulnerable background, for example, for children with general anxiety disorders or from families with inter-parental divorce / conflict. The items to assess appraisals in such measures present questions directly related to the unique family situation. For example, the item to measure self-accountability in one such questionnaire would be: “*I am responsible for the fights between my parents*” (Grych et al., 1992). So, such scales were not suitable for an assessment of appraisals in children with HFASD as the participants in the current study did not necessarily have a situation of inter-parental conflict in their family; in fact, this was not the focus of the current study. On the other hand, the appraisal questionnaire by Smith and Lazarus (1993) required minimal adaptation as it was designed for typically developing groups and the items to assess the appraisal dimensions are not contextualised, which makes their use suitable for any group of participants.

While designing new frustrating vignettes, transcribed data on the common situations reported by children in the HFASD and TD groups, during the ‘narrative descriptions’ interview were utilised (see Section 4.6.1). Four common themes were extracted from the children’s responses: ‘argument with siblings’, ‘bullying in school’, ‘rejection from peers’ and ‘emphasis on over-compliance in school’ by teachers. Four different hypothetical frustrating vignettes were thus written based on

each of these four themes and were randomly distributed across the participants, resulting in only one scenario per participant. The participants were 29 children with HFASD and 28 TD children and therefore a total of seven or eight children in each group of the HFASD and TD were assigned to each scenario. Later, at the time of analysis, data from all the four vignettes were combined in one single dataset, separately for the HFASD and TD groups. The story in each scenario unfolded in two stages. Participants were told that for each stage they should:

“Read through the description of the stage, and picture the situation that is described to you in your mind as best as you can. Pretend that you are actually living through this experience. Try to mentally create the thoughts and feelings you would have if you were actually in this situation. When you are experiencing the feelings it (the situation) evokes, please answer the questions that follow in the questionnaires.....as you think you would if you were actually experiencing the situation.”

For example, in stage 1 (*no action readiness* stage) of all the four stories, only the primary appraisal dimensions of motivational relevance and incongruence were established for child, example from one story is given below:

“You have had a long day at school. You had an argument with your friend and come back home, late and really fed-up. You plan to relax by watching TV. You change your clothes, get a burger from the kitchen and walk towards the living room to watch TV. You get to the living room and find your big sister already watching a DVD. You just hate the movie she is watching and don’t want to watch it just now. Your sister notices you standing there and she tells you to leave the room and not disturb her.”

Second stage added a factual description to the story and had two conditions to it. The two respective conditions of the stage 2 were *preparing to advance* and *preparing to retreat* situations, in terms of perceived emotional action readiness. For example, factual description in stage 2 for this TV and sister scenario was as follows:

Stage 2: Both conditions

“You tell your sister that you had a very tiring and difficult day at school. You have homework to do. You ask her to let you watch cartoons a bit and to watch her DVD later. But your sister refuses.”

The first condition of Stage 2 was *preparing to advance* condition, which provided hints about the need for an action to be taken, as shown below:

Stage 2 condition 1

“You can’t believe that your sister can be so insensitive and rude. You really want to see some cartoons and have explained her that you had a tiring day still she doesn’t care. You are just asking her to let you watch TV for few minutes. Why can’t she be a bit more reasonable? You think that she has no right to boss you like this, as it’s your home as well.”

In this *preparing to advance* version of stage 2, the sections relating to “*You really want to see some cartoons and have explained her that you had a tiring day still she doesn’t care.*” and, “*You think that she has no right to boss you like this, as it’s your home as well*” suggested something needs to be done about this situation.

Likewise, the second condition of stage 2 was *preparing to retreat* condition, where the sense of uncertainty was high and hints for nothing much can be done about this situation as any action might result in a worse situation were provided, for example, in these extracts: “*You want to change the channel but don’t know how your sister will react*” and “*You are worried that she might get upset with you if you start an argument with her*”:

Stage 2 condition 2

“You realise that everything this morning has gone wrong. You want to change the channel but don’t know how your sister will react. You don’t get along very well with her. You are worried that she might get upset with you if start an argument with her.

Now you are wondering what other bad thing is going to happen today and how will you cope.”

For each stage, children first imagined themselves to be in the described situation, and then to ensure proper imagery, they wrote a few sentences describing their reactions. Next, they completed two questionnaires to measure their appraisals and emotions. The questionnaires were presented in exactly the same order to all the participants: the appraisal questionnaire first followed by the fear questionnaire. Once they had completed the questionnaires they proceeded to the next stage and repeated the entire procedure once again for both the conditions. The same procedure was used by Smith and Lazarus (1993).

An inter-rater reliability check was once again carried out for the frustrating vignette to ensure that the pictures depicted the story correctly and that the emotional action readiness versions of the story were correct. The same 10 non-psychologists who were requested to rate the clipart pictures used in the ‘Strange Stories’ task read the stories and the two manipulated action readiness conditions. In total, the raters were asked to rate the four vignettes for accuracy of the clipart pictures in depicting the story and the eight action readiness conditions of these four stories (each story had two action readiness conditions- *preparing to advance* and *preparing to retreat*). They were asked to rate the pictures on a 0-3 scale as to how well they illustrated the story and the emotional action readiness versions (0- not at all, 1- a little bit, 2- quite close, 3- absolutely depicting). Out of the ten raters, eight gave a score of 3 for each story and two gave a score of 2. The pictures were therefore considered as reliably representative of the vignettes and their respective conditions.

4.6.4 Appraisal Questionnaire: This questionnaire was presented after each condition of the ‘hypothetical frustrating vignette’ (*i.e.* it was completed three times). This questionnaire was a modified version of that used by Smith and Lazarus (1993) with a group of university students. Language was simplified for use with children in the age group of 8-12 years. It consisted of six face-valid items designed to measure individual appraisal dimensions (see Appendix 11). Specific appraisal dimensions were the primary appraisal dimensions of motivational relevance, motivational incongruence and the secondary appraisals of self-accountability, problem-focused coping potential, emotion-focused coping potential and future expectancy. Children were asked to rate each statement on a scale of 0-11 for the extent to which it characterised their thoughts in that situation. The same 11-point Likert rating scale was used by Smith and Lazarus (1993) in their study, so in order to keep the adaptation of this standardised scale to the minimum, the same standardised scale was administered to children in the current study. Also, this was not considered to be an immediate cause of concern, since previously researchers have shown there might not be any significant differences between a 5-point and 11-point rating scale, in terms of the variation in data with regards to the means, skewness or kurtosis (John, 2008). Children were told:

“Below are a number of questions about your thoughts in the situation you just imagined. For each question please answer with a number from 0 to 11 to indicate what you were thinking in this situation during the time you just imagined”.

It may have been because this scale consisted of a single-item to measure each appraisal dimension that reliability was not reported by Smith and Lazarus. For the same reason, calculating Cronbach’s alpha for this sample was not possible.

4.6.5 Fear questionnaire: A second scale required participants to rate on a scale of 1 (not at all) to 11 (extremely) for the extent to which each of the three emotional adjectives characterised their emotional state during the stage they just imagined (see Appendix 12). This scale was also originally used by Smith and Lazarus (1993). There were three adjectives for fear (frightened, scared and afraid). Clipart pictures of smiley faces displaying each emotional adjective were also included with each adjective. Children were told:

“Below are a number of words (with pictures) that describe different synonyms for emotions of fear. Please indicate the extent to which each word (or picture) describes the way you felt within the situation you just imagined/described. Please record your answer for each word by circling the number on the eleven point scale that best describes what you were feeling”

An inter-rater reliability check with the same group of ten non-psychologists was carried out to ensure the smileys correctly represented fear adjectives. Each rater was invited to rate each smiley on a 0-3 scale (0- not at all, 1- a little bit, 2- quite close, 3- absolutely depicting) for the extent to which it was representative of the emotion. Seven out of the ten raters gave a score of ‘3’ to each of the three smiley pictures and one rater gave a score of ‘3’ to two smileys, but ‘2’ to one smiley clipart picture. Reliability coefficient of the original fear scale (3 items) as used by Smith and Lazarus (1993) was .95. Reliability in the current study was also good for the HFASD (.79) and TD groups (.89).

4.6.6 Spence Children’s Anxiety Scale: The SCAS (see Appendix 13) was a 45-item self-report questionnaire that was designed by Spence (1997) to measure six specific sub-types of anxiety and the overall levels of anxiety closely resembling the anxiety categories proposed by the *DSM-IV* (APA, 1994). Other commonly used self-report scales for the measurement of anxiety are the Multidimensional Anxiety

Scale for Children (MASC; March, Sullivan, & Parker, 1999), Screen for Child Anxiety Related Emotional Disorders (SCARED; Birhamer, Brent, & Chiappetta et al., 1999). In Study 1, the SCAS scale was chosen over MASC for an assessment of anxiety symptoms, as the SCAS sub-scales more closely resemble the *DSM-IV* categories of anxiety disorders, symptoms widely used in clinical practice (Nauta et al., 2004). On the other hand, the SCARED scale although has many similarities in terms of the symptoms it assess, it does not have a scale for obsessive-compulsive disorders, thus giving the SCAS scale an advantage. Also, the SCAS scale has a child and a parent report version that allows a thorough assessment of anxiety types in children (MacNeil, et al., 2009). This scale was not adapted and was used in its standardised form.

Children were asked to rate each item on a four-point scale (0-3) of severity (*Never, Sometimes, Often, Always*). Spence (1997, 1998a) reported that the SCAS scale had an internal reliability coefficient of .93 and a Guttman split-half reliability of .92 when examined with a group of 2052 children (8-12 years) drawn randomly from a community sample. In the study by Spence (1997), test-retest reliability of the scale tested on a group of 344 children out of 2052 at a gap of six months was found to be .60. Further factor analysis (Spence, 1998b) confirmed the subtypes of anxiety measured in the scale to be consistent with typology of the *DSM-IV*. This scale had both child- and parent-report versions.

Scores from '0 to 3' were assigned to the items on the scale, and the sub-totals were extracted for each of the following sub-scales: *Panic attack and agoraphobia, Separation anxiety, Physical injury fears, Social phobia, Obsessive-compulsive and Generalized anxiety*. In Study 1, all the sub-scales demonstrated good internal

reliability that varied from .84 to .92. A final score by adding all the sub-totals were also calculated for both parent and child-report versions. Muris, Schmidt and Merckelbach (2000) specified the cut-off scores for each sub-scale and the total scale for children of different age-groups and genders. The cut-off scores are shown in Table 4.1. A score higher than the cut-off levels indicates the presence of clinically significant levels of anxiety symptoms. It could be completed in approximately 10 minutes each by both parent and child.

Table 4.1

Cut-off scores for the presence of clinical levels of anxiety symptoms in children

SCAS sub-scale	Cut-off score: Boys	Cut-off score: Girls
Panic attack and agoraphobia	6	8
Separation anxiety	7	8
Physical injury fears	5	7
Social phobia	6	8
Obsessive-compulsive fears	7	7
Generalised anxiety	8	9
Total anxiety	37	44

4.6.7 Vocabulary sub-test from Wechsler Intelligence Scale for Children- Fourth UK Edition (WISC-IV): This was a test from verbal sub-scale of the WISC IV (Wechsler, 2003) for assessing vocabulary of children aged 6 years to 16 years and 11 months (refer to Appendix 14). This scale was selected for use in Study 1 as it is a standard instrument widely used for the assessment of IQ.

The full WISC-IV scale is composed of six sub-tests, however for the purpose of Study 1, only the vocabulary sub-test was administered to participant children in both

the groups, since this sub-test is known “*to be the best single indicator of general intelligence*” (Groth-Marnat, 2009; p. 151); and has been shown to have a correlation of .72 with the full scale IQ on the WISC-IV scale. It was thus used as a proxy measure of cognitive ability in Study 1. Standardisation of the WISC-IV scale was carried out on a group of 2200 children, matched on the variables of age, gender, geographic region, ethnicity and socio-economic status according to the 2002 U.S. census data. The WISC-IV scale was found to have a high internal consistency coefficient of .90 and of .94 for the vocabulary sub-test (Wechsler, 2003). Reliability has been shown to be .97 and .89 for this sub-test. This sub-test of the WISC-IV scale showed good internal reliability with the HFASD (.82) and TD (.84) groups in Study 1 as well.

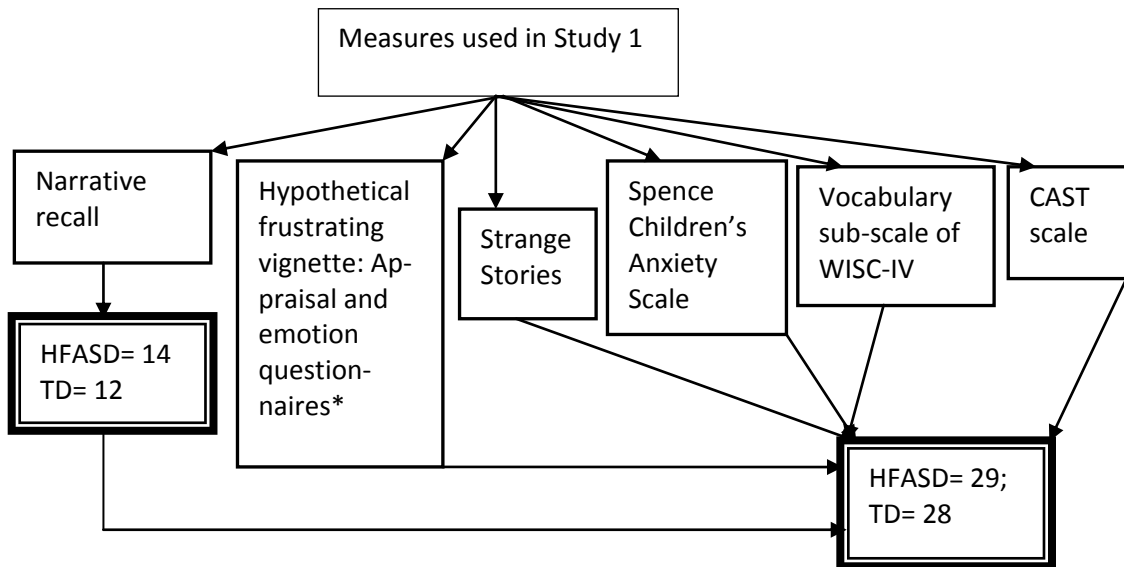
Children were told: “*I am going to say some words. Listen carefully and tell me what each word means.*” Scoring was carried out in accordance with administration instructions in the WISC-IV manual and the scaled scores were used for the purpose of analysis. This test was carried out by telephone and in face-to-face interviews. Administration took 5-10 minutes.

4.6.8 Childhood Autism Syndrome Test (CAST): The CAST scale was designed and standardised by Scott, Baron-Cohen, Bolton and Brayne (2002) for screening children aged 4-12 years at the risk for autism-related symptoms. Selection of this scale was primarily convenience based as this is a standard measure and freely available for download. It consists of 37 statements about the child's current level of functioning in social, cognitive and communication domains (see Appendix 15). Parents are asked to mark either 'yes' or 'no' for each statement on the scale.

There was a finer division in the scale for scoring of *yes* and *no* responses to the items that related to some autism-related symptoms and for the control items. For example, statements corresponding to social difficulties of the kind exhibited by children with autism (e.g., “*Does s/he like to do things over and over again, in the same way all the time?*”) were marked separately from the statements corresponding to typical social development (e.g., “*Does s/he join in playing games with other children easily?*”). A response of *yes* to the former kind of statements was given a score of 1; however the same *yes* response was scored as 0 for the latter category of statements. Similarly, a response of *no* was scored as 0 for the statements corresponding to autism; a response of *no* was scored as 1 for the statements corresponding to typical development in children.

There were also five control statements that were not included in the scoring procedure. The scores were added to obtain a total score and the cut-off total score of 15 or more is considered to be indicative of the signs of ASD in children (Scott et al., 2002). It took 10-12 minutes for the parents to complete this scale. The CAST scale is useful in identifying autism specific symptoms, such as repetitive and stereotyped patterns of behaviour, the ability to engage in social conversation, pretend play, age of onset of language delay, and speech and communication difficulties in children. The CAST scale has a good test-retest reliability rate (Williams Scott, & Stott et al., 2004) and can effectively distinguish between children in autism group from TD population (Johnson & Myers, 2007). In Study 1, the CAST scale showed high reliability with Cronbach’s alpha coefficient of .80 in the HFASD group and .79 in the TD group.

Information on the number of participant children from the HFASD and TD groups on which administration of the eight measures was carried out in Study 1 (reported above from Sections 4.6.1-4.6.8) is presented in a flow chart below:



*Footnote: There were four possible scenarios, which were distributed across the sample so that each child was presented only with one.

Figure 4.2: Breakdown of the number of participants for each measure in Study 1

4.7 Preliminary analysis

4.7.1 Normality test: Scores on all the scales and their sub-scales were converted to standardised z scores to find outliers (scores higher than 1.96), which could have affected skewness and kurtosis in data (Field, 2006). A total of six outliers (in the SCAS sub-scales of separation anxiety, panic attack and agoraphobia and fear questionnaire) in three participants were found: two outliers were found in data for two TD children and four in data for one child with HFASD. The scores for these participants had z values between 2.00 and 4.25, so data for these three participants were deleted. This resulted in inclusion of only 29 children in the HFASD group and 28 in the TD group, in contrast to 30 children being recruited in each group.

In the HFASD and TD groups, the z scores for skewness were now within the acceptable range: -1.96 to +1.96. However, the z scores for kurtosis of some variables like motivational incongruence, panic attack and separation anxiety were still greater than 1.96. Kurtosis is considered to have less impact upon the robustness of parametric statistics than skewness (Miles & Shevlin, 2001). DeCarlo (1997) has argued that “*for univariate and multivariate data, tests of means appear to be affected by skew more than kurtosis*” (p. 297). Further, modest violations of normality assumptions can be tolerated (Field, 2006). A deviation from normality assumptions because of kurtosis values alone was therefore not deemed problematic enough to necessitate non-parametric analyses. Parametric statistics were thus used for analysing data from Study 1, though as an extra measure of caution, the homogeneity of variance assumption for normality was also examined, as stated below.

4.7.2 Equality of variances: If data deviates substantially from normality, the homogeneity of variances across two groups can be affected (Field, 2006). To check whether there was a serious problem in data, the variances were examined by carrying out Levene’s test (DeCarlo, 1997). None were significant; therefore, parametric statistical analyses were carried out.

4.7.3 Scale of measurement for parametric analysis: For the appraisal questionnaire, respondents were asked to respond on a scale ranging from 0 to 11. On such rating scales, it is difficult to ascertain whether intervals between 0 and 1 are equal to intervals between 10 and 11 (Miles & Shevlin, 2001). Each number represents a different degree of magnitude and so it could be an interval scale, but since it is a Likert scale it can be considered ordinal as well. This scale was originally

developed and used by Smith and Lazarus (1993) in their study, which was analysed using parametric statistics though the issue of interval or ordinal level of measurement was not discussed. This suggests that they might have assumed that since it is not very clear whether this scale should be classified as an ordinal or interval scale, rules for normality assumptions can be relaxed.

In support of this argument, Abelson (1995) has suggested that in the cases, where it is difficult to decide whether a scale is interval or ordinal, the rule about level of measurement for normality tests can be adapted; and parametric analyses can be carried out. Similarly, other scales such as the SCAS (Spence, 1997) and fear questionnaire (Smith & Lazarus, 1993) can either be classified as interval or ordinal and have been analysed by parametric statistics in previous studies. Data for Study 1 was therefore analysed using parametric statistics, assuming the scales were ordinal.

4.8 Summary

In summary, 30 children in the HFASD group and TD group were recruited from various sources including the National Autistic Society, National Health Service, but data from only 29 children in the HFASD group and 28 children in the TD group was analysed after removing outliers (see Section 4.7.1). Some children were tested by telephone due to the practical difficulties in recruitment from the local area; the accuracy of this non-standard technique was assessed in a separate additional study. The adapted versions of the standardised techniques of ‘narrative recall’, ‘hypothetical vignette’, ‘appraisal questionnaire’ (Smith & Lazarus), ‘fear questionnaire’ (Smith & Lazarus); the original standardised form of the ‘SCAS’ (Spence, 1997), ‘vocabulary sub-test of the WISC-IV’ (Wechsler, 2003) and the ‘CAST’ scale (Scott et al., 2002) were administered to all the participants.

Chapter 5: Results Study 1

5.1 Introduction

Between-group differences for the variables of fear, anxiety (Hypothesis 1), TOM ability (Hypothesis 2) and appraisal dimensions (Hypothesis 3) will be investigated through *t*-tests for two independent groups. The correlation results will be reported for assessing association of appraisals with fear, anxiety (Hypothesis 4) and TOM ability (Research Question 2). For an assessment of difference in the appraisal dimensions across the *preparing to advance* and *preparing to retreat* conditions of the 'hypothetical frustrating vignette', results from 3*2 mixed ANOVA analyses will be presented (Research Question 1).

5.2 Characterisation of sample

On the CAST scale, the HFASD group (mean = 18.79, S.D. = .90) had a higher mean than the TD group (mean = 4.06, S.D. = .74). Noted differences between the HFASD and TD groups were tested by carrying out *t*-test for two independent groups on SPSS (2009). Effect size was calculated using the following formula: Effect size (d) = $\sqrt{t^2 / t^2 + df}$, (Cohen, 1988). A value of d between .1-.4 implies small effect, a value between .5-.7 suggests a medium effect size and a value between .8- 1.0 indicates a large effect size. The noted difference in the CAST scores between the HFASD and TD groups was also significant with a large effect size, t ($df = 56$) = 79.92, $p = .001$, $d = .99$. The cut-off score of 15 or above has been shown to be suggestive of a child likely to have so many symptoms of autism that it is likely that they would receive the clinical diagnosis of autism (Scott, Baron-Cohen, Bolton, & Brayne, 2002; Williams et al., 2004). In the present study, scores for all children in

the HFASD group exceeded the cut off score of 15, ranging from 15-27. On the other hand, the scores of all children in the TD group were below 15, ranging from 1-12.

Table 5.1 shows the number of children in the HFASD and TD groups, who previously had the diagnosis of HFASD or other developmental delays; and whether the respective teacher/ health professionals expressed any concerns about the children's development.

Table 5.1

Parents' responses on the CAST scale

Questions on CAST scale	No. of parents who responded YES	
	HFASD (N = 29)	TD (N = 28)
Has the teacher or health professional expressed concern about child's health?	28	0
Has the child ever been diagnosed with any of these?		
Language delay	4	0
Hyperactivity/ ADHD	0	0
Hearing or visual difficulties	6	0
HFASD condition	29	0
A physical disability	1	0

As shown in Table 5.1, parents' responses suggested that concerns about their child's development were expressed by the school teachers or health professionals for each child in the HFASD group, but none for any child in the TD group. All children in the HFASD group were also previously diagnosed with autism spectrum disorder's conditions including AS: four were diagnosed with language delays, six with hearing/ visual difficulties and one with a physical disability at younger ages. None of these children however had any signs of any of these conditions other than ASD at their current age. Taken together, these findings suggest that children in the HFASD group had symptoms indicative of autism.

For the vocabulary sub-test of the WISC-IV scale, children in the HFASD group had similar scaled scores (mean = 11.06, S.D. = .46) to those in the TD group (mean = 11.78, S.D. = .40). These were not significantly different, $t(df = 56) = .60, p = .30$. This finding suggests that children in the HFASD and TD groups had an average cognitive ability, since the vocabulary sub-test of the WISC-IV has been shown to be highly correlated with the full scale IQ (Groth-Marnat, 2009) and was used as a proxy measure of the full-scale IQ here (see Section 4.6.7).

Taken together, these findings from the CAST scale and the vocabulary sub-test suggest that children in the HFASD group had symptoms indicative of autism and average cognitive ability; while children in the TD group did not display sufficiently high symptoms to indicate the presence of ASD, and were also of average cognitive ability. The classification of children in the respective groups of HFASD and TD was therefore reliable.

5.3 Demographic Information

Demographic information was also examined for between group differences as shown in Table 5.2. Difference in age between the HFASD (mean= 7.25; S.D.= 1.29) and TD (mean= 7.00; S.D.= 1.10) groups, as shown in Table 5.2, was not found to be significant, $t(df = 56) = -3.12, p = .70$. Similarly, difference between the HFASD and TD groups in the gender of the participants was not significant, $\chi^2(df= 1, N = 57) = 2.51, p = .11$.

Additional information about the number and the gender of siblings of children in the HFASD and TD groups was collected. This was necessary because the ‘hypothetical frustrating vignette’ technique involved a sister in one story; thus a

significant difference between the two groups on this variable could have biased their responses. Six children in the HFASD group and four in the TD group had no siblings; 11 children in HFASD group and 14 children in the TD group had a sister and 12 children in the HFASD group and 10 in the TD group had a brother. These differences in the siblings' gender, of the participating children with siblings, were also non-significant, $\chi^2(1, N = 47) = 1.27, p = .16$.

Table 5.2.

Frequency counts of age and gender in the HFASD and TD groups

	HFASD (N = 29)	TD (N = 28)
Age (years. months)		
8-8.11	12	8
9-9.11	10	12
10-10.11	6	6
11-11.11	1	2
Gender		
Male	23	16
Female	6	12
No. of siblings		
Sister	11	14
Brother	12	10

5.4 Difference between the HFASD and TD groups on the fear and anxiety scores

(Hypothesis 1)

Key findings:

- The HFASD group had significantly higher mean scores than the TD group for fear across all the three action readiness conditions of the hypothetical frustrating vignette; assessed through the fear questionnaire (Smith & Lazarus, 1993).
- For scores on anxiety obtained through the SCAS (Spence, 1988) too, the HFASD group had significantly higher mean scores than the TD group.

Independent groups' *t*-tests were carried out to investigate differences between the two groups for fear assessed through the three action readiness conditions of the 'hypothetical frustrating vignette'. Differences between the two groups were also assessed for anxiety scores obtained through child and parent report versions of the SCAS (Spence, 1997). Since fear was measured in the three action readiness conditions of the 'hypothetical vignette', an average score for fear was calculated for both the groups. The HFASD group had significantly higher average mean scores for fear than the TD group (HFASD: mean = 5.69; S.D. = .84; TD: mean = 2.54, S.D. = 1.09; $t(df = 55) = 14.38, p < .001, d = .98$).

The HFASD group also appeared to have higher mean values for the six sub-scales of the child-report version of the SCAS scale (Spence, 1997), as shown in Table 5.3. To assess the significance of these differences between the two groups, *t*-tests were carried out. Since one *t*-test was carried out on each of the six sub-scales, the potential Type I errors were addressed using a Bonferroni correction. The adjusted *p* value was therefore .008, *i.e.* .05/6 (Field, 2006; Howell, 2007). As shown in Table 5.3, all the differences were significant ($p < .008$) with medium to large effect size. It should also be noted that scores of the HFASD group on all the sub-scales of SCAS exceeded their respective cut-off points (see Table 4.1). Children with HFASD assessed in the current sample therefore might have had clinically significant levels of anxiety symptoms. In the TD group, scores for all the sub-scales were below the cut-off level, except for the sub-scale of *physical injury fears* that only slightly exceeded the cut-off level of 5. These findings provided further support for the Hypothesis 1: that the HFASD group would have higher means for anxiety assessed through the SCAS (Spence, 1997) compared to the TD group.

Table 5.3.

Difference between the HFASD and TD groups on anxiety (child-report)

Anxiety category (child-report)	HFASD (N = 29)		TD (N = 28)		<i>t</i> (<i>p</i> value) df = 56	<i>Effect size (d)</i>
	Mean	S.D.	Mean	S.D.		
Panic attack and agoraphobia	17.60	1.10	4.39	1.47	38.82 (<i>p</i> =.004)	.57
Separation anxiety	11.43	1.38	4.32	1.68	17.66 (<i>p</i> =.007)	.92
Physical injury fears	12.47	1.69	5.04	2.09	14.87 (<i>p</i> =.006)	.89
Social phobia	14.77	1.58	2.46	1.14	34.30 (<i>p</i> =.004)	.97
Obsessive-compulsive	16.60	2.21	1.89	.87	32.92 (<i>p</i> =.001)	.97
Generalised anxiety	15.43	1.19	4.50	1.14	35.63 (<i>p</i> =.006)	.98

There were also six sub-scales in parent version of the SCAS (Spence, 1997).

Again, six *t*-tests were used to compare the two groups and so the same Bonferroni correction was also applied here. The HFASD group was found to have significantly higher mean values for all the six sub-scales of the parent-report version of SCAS (Spence, 1997) with large effect sizes (see Table 5.4). Similar to the findings for child-report version of the SCAS scale, parents' reports for the presence of anxiety-related symptoms exceeded the cut-off level for all the six sub-scales in the HFASD group. However in the TD group, scores on sub-scales of the SCAS scale were below their cut-off level (for full list of the cut-off scores, see Table 4.1). These findings provided support for the Hypothesis 1 of Study 1: that the HFASD group had higher mean scores for fear and anxiety than the TD group.

Table 5.4.

Difference between the HFASD and TD groups on anxiety symptoms (parent-report)

Anxiety category (parent-report)	HFASD group (N = 29)		TD group (N = 28)		<i>t</i> (<i>p</i> value), effect size (<i>d</i>); <i>df</i> = 56
	Mean	S.D.	Mean	S.D.	
Panic attack and agoraphobia	18.53	.51	4.5	.51	105.07(.001), <i>d</i> =.9
Separation anxiety	10.50	.58	2.50	.53	59.83(.006), <i>d</i> =.9
Physical Injury fears	11.50	.52	2.54	.57	67.12(.002), <i>d</i> =.9
Social phobia	11.60	.49	1.54	.51	76.16(.001), <i>d</i> =.9
Obsessive-compulsive	15.53	.51	4.93	1.88	29.71(.006), <i>d</i> =.9
Generalised anxiety	14.13	1.63	3.50	.51	32.95(.003), <i>d</i> =.9

5.5 Scores on the appraisal dimensions and difference across the three action readiness conditions in the HFASD and TD groups (Hypothesis 3 & Research Question 1)

Key findings:

- The HFASD group had significantly lower mean scores than the TD group for the appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and future expectancy, but higher mean scores for self-accountability across all the three action readiness conditions of the ‘hypothetical frustrating vignette’.
- Difference in the mean scores between the *preparing to advance* and *preparing to retreat* conditions, in comparison to the *no action readiness* condition of the ‘hypothetical frustrating vignette’ appeared different between the HFASD and TD groups.
- Mean scores for the appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy appeared to be higher in the *preparing to advance* condition but lower in the *preparing to retreat* condition in comparison to the *no action readiness* condition in both the HFASD and TD groups.

Children’s appraisals were assessed using the appraisal questionnaire (Smith & Lazarus, 1993) across the three different stages of ‘hypothetical frustrating vignette’: *no action readiness, preparing to advance* and *preparing to retreat*. To test for the

significance of any difference in scores between the HFASD and TD groups or the difference in means across the three action readiness conditions of hypothetical vignette, separate 3*2 mixed ANOVA analyses were carried out for each of the six appraisal dimensions. In this analysis, within group variable was action readiness condition that had three levels: *no action readiness* condition, *preparing to advance* condition and *preparing to retreat* condition. The between group variable was type of group with two levels: HFASD and TD. Before carrying out ANOVA analyses, normality assumptions corresponding to equality of variances and sphericity for reliability were checked (Field, 2006). Mauchly's test of sphericity was examined for the homogeneity of variances assumption, since there were more than two factors in the ANOVA model.

For all the six appraisal dimensions, the output from Mauchly's test of sphericity were found to be non-significant with a *p* value of higher than .05, the assumption of sphericity was therefore met. The second assumption for reliably carrying out ANOVA analyses concerned the variances of data. Levene's test analysis for all the three levels of repeated measures variables (the six appraisal dimensions) was also found to be non-significant for the three action readiness conditions of 'hypothetical frustrating vignette': *no action readiness*, *preparing to retreat* and *preparing to advance*.

The variances for the six appraisal dimensions were therefore similar for both the groups and for each condition of hypothetical vignette suggesting that data were suitable for these ANOVA analyses. Since multiple ANOVA analyses were carried out, Bonferroni correction to reduce the probability of a Type-I error occurring was also carried out. This was achieved by dividing the *p* value of .05 by the number of ANOVA analyses planned, *i.e.* 6. The new corrected *p* value was therefore set at

.008. The results are reported for each of the six appraisal dimensions, separately, in the following sections. Descriptive statistics are presented in Table 5.5.

Table 5.5

Mean values of appraisal dimensions for the HFASD and TD groups

Appraisal dimension	Action readiness condition	HFASD group		TD group	
		Mean	S.D.	Mean	S.D.
Motivational relevance	<i>No action readiness</i>	9.93	.78	3.96	.84
	<i>Preparing to advance</i>	7.97	.82	2.89	.83
	<i>Preparing to retreat</i>	10.00	.84	4.75	.85
Motivational incongruence	<i>No action readiness</i>	8.90	.77	2.93	.81
	<i>Preparing to advance</i>	7.97	.78	1.96	.88
	<i>Preparing to retreat</i>	9.97	.81	5.07	.83
Self-accountability	<i>No action readiness</i>	5.90	.77	1.96	.79
	<i>Preparing to advance</i>	3.83	.97	2.00	.82
	<i>Preparing to retreat</i>	7.00	.84	4.93	.86
Emotion-focused coping potential	<i>No action readiness</i>	2.03	.82	9.04	.88
	<i>Preparing to advance</i>	5.97	.81	9.86	.80
	<i>Preparing to retreat</i>	1.52	.51	6.75	1.23
Problem-focused coping potential	<i>No action readiness</i>	2.97	.86	9.00	.82
	<i>Preparing to advance</i>	6.10	.77	9.89	.78
	<i>Preparing to retreat</i>	3.00	.84	7.04	.84
Future expectancy	<i>No action readiness</i>	2.03	.82	8.29	.94
	<i>Preparing to advance</i>	4.00	.84	8.96	.79
	<i>Preparing to retreat</i>	1.48	.51	6.54	.51

The values shown in Table 5.5 indicate that the HFASD group maintained higher mean values for motivational relevance, motivational incongruence and self-accountability than the TD group, across the three action readiness conditions. On the other hand, lower mean scores for the HFASD group compared to the TD group were found for the appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and future expectancy. For both the groups, scores for motivational relevance, motivational incongruence and self-accountability

decreased from the *no action readiness* to *preparing to advance* condition, but increased from the *no action readiness* to *preparing to retreat* condition. A reverse trend was observed for the other three appraisals of emotion and problem-focused coping potential and future expectancy, as can be seen in Table 5.5.

A closer look at Table 5.5 shows a greater difference in the HFASD group's mean values between the *no action readiness* to *preparing to advance* condition for all appraisal dimensions except motivational incongruence, where a similar difference for both the groups is apparent. Similarly, between the *preparing to advance* to *preparing to retreat* conditions, the difference in mean scores was greater for the HFASD group compared to the TD group, for all the four secondary appraisal dimensions of self-accountability, problem and emotion-focused coping potential and future expectancy. However, in the case of the primary appraisals of motivational relevance and incongruence, the difference in scores between the *preparing to advance* and *preparing to retreat* condition was higher in the TD group.

To test for the significance of these differences, separate 3*2 mixed ANOVA analyses were carried out for each of the six appraisal dimensions, where the within group variable was action readiness condition that had three levels: *no action readiness* condition, *preparing to advance* condition and *preparing to retreat* condition. The between group variable was type of group with two levels: HFASD and TD. The output from ANOVA analyses are shown below in Table 5.6.

Table 5.6

3*2 mixed ANOVA results to test means of appraisals in the three action readiness conditions

Appraisal dimension	Main effect of action readiness	Main effect of group	Interaction effect (group*action readiness)
Motivational relevance	$F(2, 110) = 113.75$, $p < .001$, $\eta^2 = .67$	$F(1, 55) = 1268.87$, $p < .001$, $\eta^2 = .96$	$F(2, 110) = 6.57$, $p = .002$, $\eta^2 = .11$
Motivational incongruence	$F(2, 110) = 120.14$, $p < .001$, $\eta^2 = .67$	$F(1, 55) = 3646.46$, $p < .001$, $\eta^2 = .98$	$F(2, 110) = 7.15$, $p = .001$, $\eta^2 = .11$
Self-accountability	$F(2, 110) = 362.73$, $p < .001$, $\eta^2 = .79$	$F(1, 55) = 3646.46$, $p < .001$, $\eta^2 = .87$	$F(2, 110) = 28.26$, $p < .001$, $\eta^2 = .34$
Emotion-focused coping potential	$F(2, 110) = 289.63$, $p < .001$, $\eta^2 = .84$	$F(1, 55) = 1479.92$, $p < .001$, $\eta^2 = .96$	$F(2, 110) = 48.29$, $p < .001$, $\eta^2 = .47$
Problem-focused coping potential	$F(2, 110) = 219.42$, $p < .001$, $\eta^2 = .80$	$F(1, 55) = 1108.93$, $p < .001$, $\eta^2 = .95$	$F(2, 110) = 35.96$, $p < .001$, $\eta^2 = .39$
Future expectancy	$F(2, 110) = 169.78$, $p < .001$, $\eta^2 = .75$	$F(1, 55) = 1852.21$, $p < .001$, $\eta^2 = .97$	$F(2, 110) = 14.32$, $p < .001$, $\eta^2 = .21$

The significant main effect of *action readiness* for each of the six appraisal dimensions suggest that if data from the HFASD and TD groups are combined, the changes in means of each of the six appraisals, across the three action readiness conditions, were significant with a large effect size (η^2). Similarly, the main effect of group was significant with a large effect size, indicating that the overall change in the appraisal dimensions was significantly different between the HFASD and TD groups. Interaction effects between the *type of group* and *action readiness conditions*, as shown in Table 5.6, were also significant for all the six appraisal dimensions, albeit with small to medium effect sizes. Interaction effects between the three action readiness conditions and the two groups for the two primary appraisal dimensions are displayed through line charts in Figures 5.1 and 5.2 below.

Figure 5.1: Primary appraisal dimension of motivational relevance

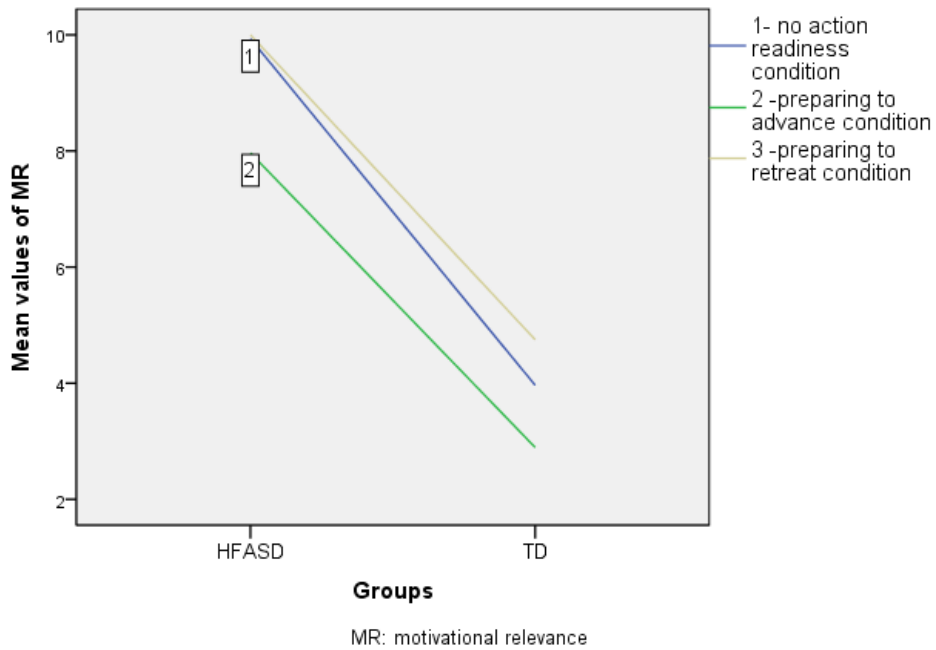
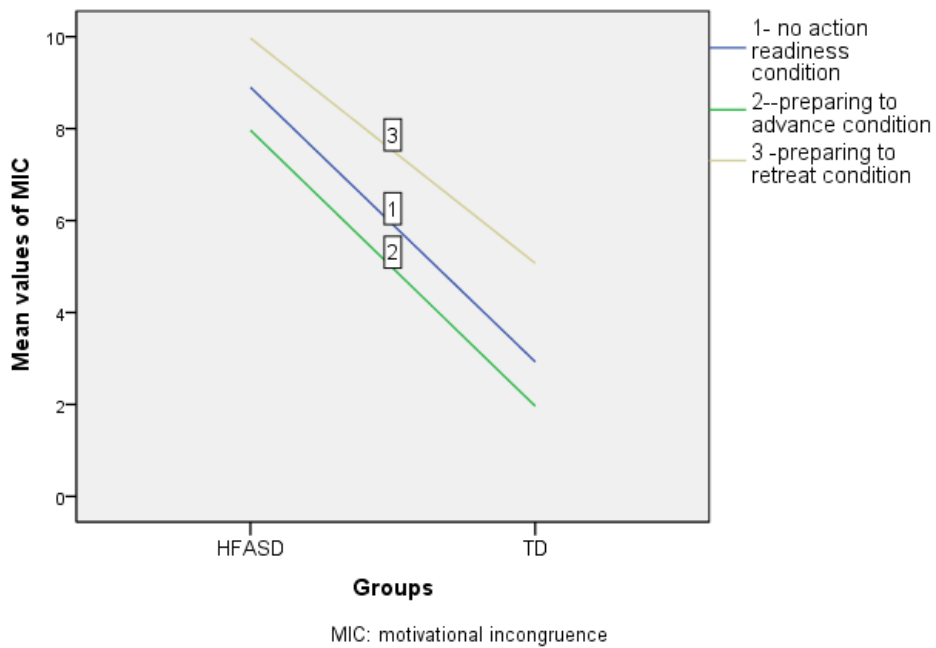


Figure 5.2: Primary appraisal dimension of motivational incongruence



A significant interaction effect suggests that the difference in mean values of the primary appraisal dimensions of motivational relevance across the three action

readiness conditions of *no action readiness*, *preparing to advance* and *preparing to retreat* were significantly different between the HFASD and TD groups. For example, as can be seen in Figures 5.1 and 5.2, the difference in mean scores between the conditions of *no action readiness* and *preparing to advance*, for both the primary appraisal dimensions appeared to be greater in the HFASD group than the difference between the same two conditions in the TD group. Similarly, the difference in means between the conditions of *no action readiness* and *preparing to retreat* conditions in the HFASD group seemed to be smaller than the difference between the same two conditions in the TD group. Interaction effect between the three action readiness conditions and the two groups was also significant for the four secondary appraisal dimensions; these are presented through line charts in Figures 5.3-5.6.

Figure 5.3: Secondary appraisal dimension of self-accountability

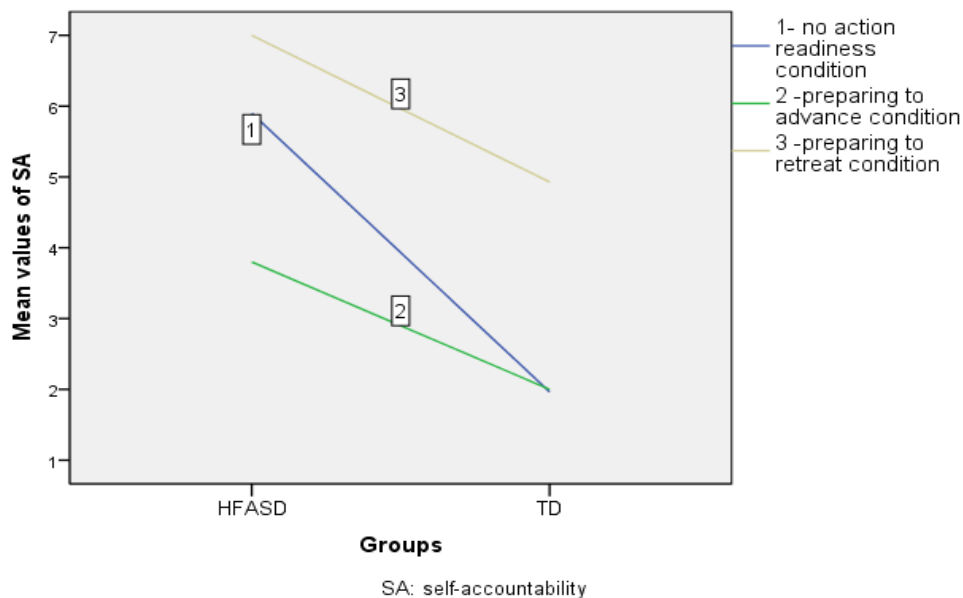


Figure 5.4: Secondary appraisal dimension of problem-focused coping potential

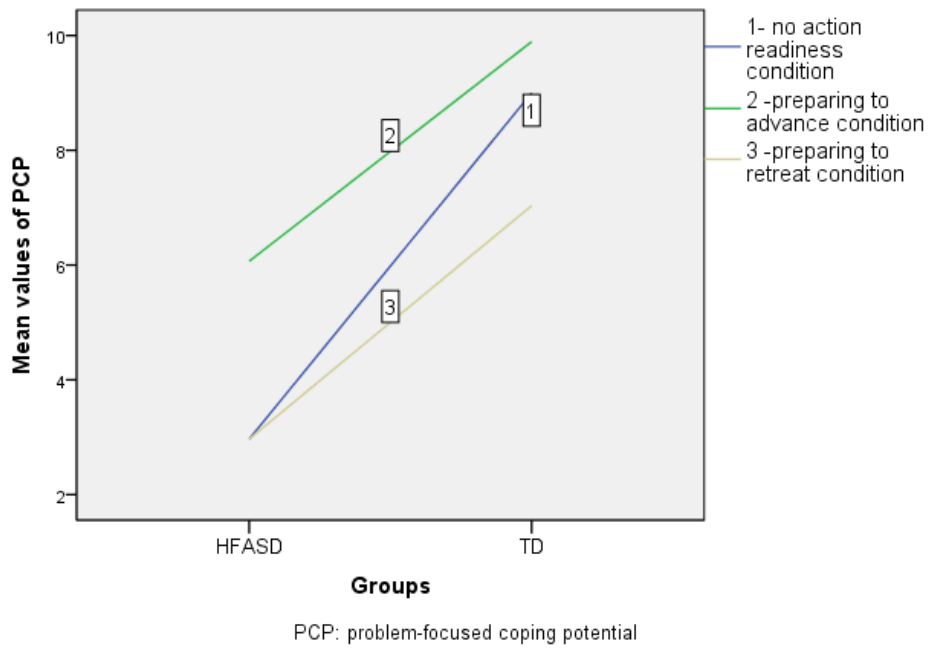


Figure 5.5: Secondary appraisal dimension of emotion-focused coping potential

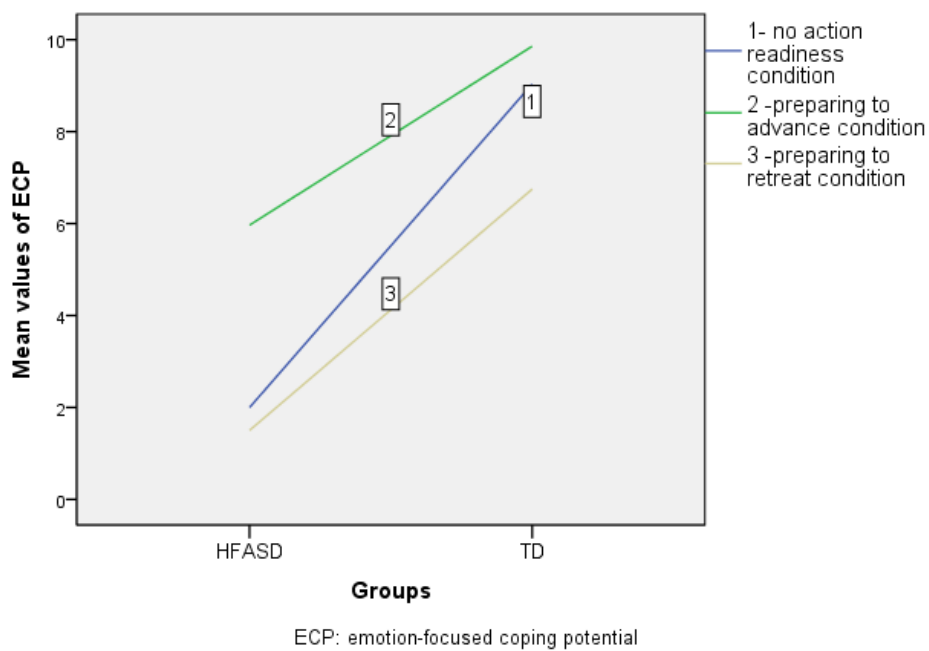
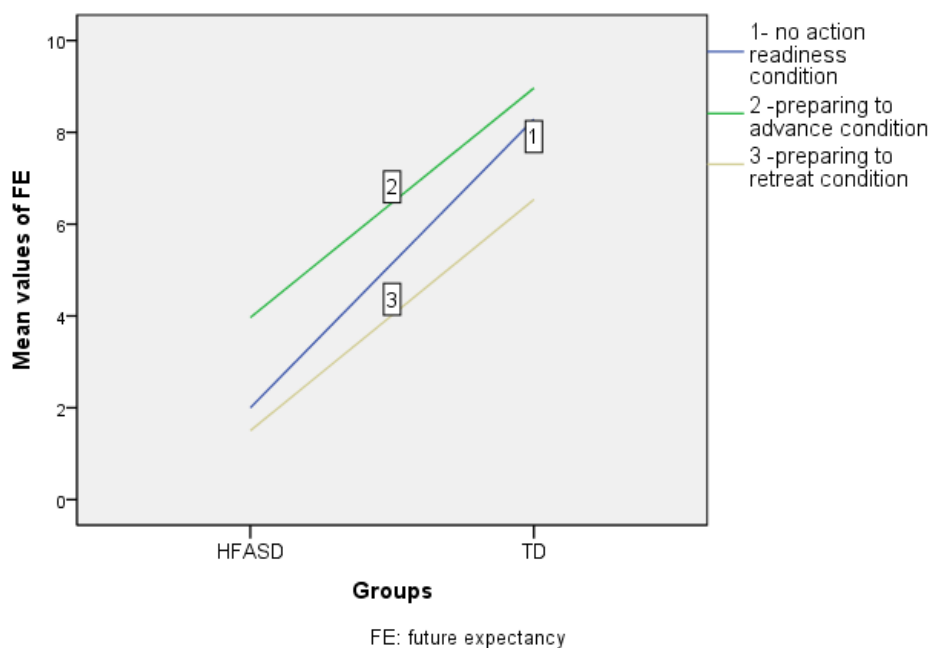


Figure 5.6: Secondary appraisal dimension of future expectancy



For the other three secondary appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy (see Figures 5.4-5.6), the difference in mean values between the two conditions of *no action readiness* and *preparing to retreat*, seemed smaller for the HFASD group than the TD group. For these three appraisals, reverse was observed for the difference in means between the conditions of *no action readiness* and *preparing to retreat*.

Taken together, these findings informed the Hypothesis 3 and Research Question 1 of Study 1, since these suggest that the difference in mean value of the six appraisals across the three stages of *no action readiness*, *preparing to advance* and *preparing to retreat* conditions were significantly different between the HFASD and TD groups.

5.6 Association between appraisals, fear and anxiety (Hypothesis 4)

Key findings:

- The six appraisal dimensions had a significant correlation with fear (measured through the fear questionnaire- Smith & Lazarus, 1993) and anxiety (assessed through the SCAS scale- Spence, 1997) in the HFASD group, however fewer significant correlations were found in the TD group.
- The appraisal dimensions of motivational relevance, motivational incongruence and self-accountability had a positive association with fear and anxiety, while the other three appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy had a negative correlation with the scores on fear and anxiety.

Correlation analyses were carried out to determine the relationships between appraisal dimensions, and fear and anxiety scores from child report version of the SCAS scale (see Table 5.7).

Table 5.7.

Correlation analyses: appraisals, fear and anxiety

Appraisal dimension	Fear: <i>r</i> (<i>p</i> value)		Anxiety: <i>r</i> (<i>p</i> value)	
	HFASD	TD	HFASD	TD
Motivational relevance	.49 (.02)	.25 (.03)	.40 (.01)	.15 (.78)
Motivational incongruence	.56 (.01)	.30 (.03)	.47 (.01)	.10 (.64)
Emotion-focused coping potential	-.72 (.004)	-.20 (.04)	-.59 (.006)	-.17 (.79)
Problem-focused coping potential	-.67 (.004)	-.15 (.76)	-.49 (.02)	-.12 (.67)
Self-accountability	.46 (.01)	.17 (.80)	.51 (.01)	-.09 (.51)
Future expectancy	-.39 (.02)	-.18 (.83)	-.58 (.01)	-.14 (.59)

As can be seen in Table 5.7, for the HFASD group, there were significant associations between fear and the six appraisal dimensions, and between anxiety and appraisals. For the TD group, the only significant correlations were between the two primary appraisals and fear; and also between fear and emotion-focused coping potential. None of the anxiety-appraisal correlations were significant for the TD

group. Differences between the correlation coefficients for the HFASD and TD groups were examined to see whether they were statistically significant. For this purpose, each correlation was first converted into its z -score (r'), in accordance with the table of critical values (Howell, 2007). The obtained z -scores were tested to examine their statistical significance using the formula: $z = (r'_1 - r'_2) / \sqrt{[1/(N_1 - 3)] + [1/(N_2 - 3)]}$; z values that were higher than 1.96 were considered statistically significant. Difference between the correlation values across the TD and HFASD groups, within each type of outcome, shown in Table 5.7, were found to be statistically significant. Associations for the HFASD group were therefore significantly different than the association of appraisals with fear and anxiety in the TD group.

Taken together, these findings indicated that the scores on appraisals of future expectancy, emotion-focused coping potential and problem-focused coping potential, were inversely associated with the scores on fear and anxiety in the HFASD group. On the other hand, the scores on appraisals of motivational relevance, motivational incongruence and self-accountability had a linear relation with fear and anxiety in the HFASD group. These findings were not statistically significant for the TD group. These findings supported the Hypothesis 4 of Study 1: that the secondary appraisal dimensions would be significantly associated with fear and anxiety in the HFASD group.

5.7 Difference in TOM ability between the HFASD and TD groups (Hypothesis 2)

Key Findings:

- The HFASD group had significantly lower mean scores for the average TOM ability scale, the sub-scale that measured children's ability to identify the truthfulness of non-literal utterances, the ability to explain the non-literal utterances and the ability to infer advanced mental state of the central character in the stories; these were assessed using 'Strange Stories' task (Happé, 1994).

Differences between the HFASD and TD groups on the sub-scales of TOM ability were assessed by carrying out *t*-tests comparing two independent groups of HFASD and TD. For the average TOM score in the 'Strange Stories' task, the HFASD group (mean = 84.37, S.D. = 4.09) scored lower than the TD group (mean = 113.00, S.D. = 4.00) as shown in Figure 5.7.

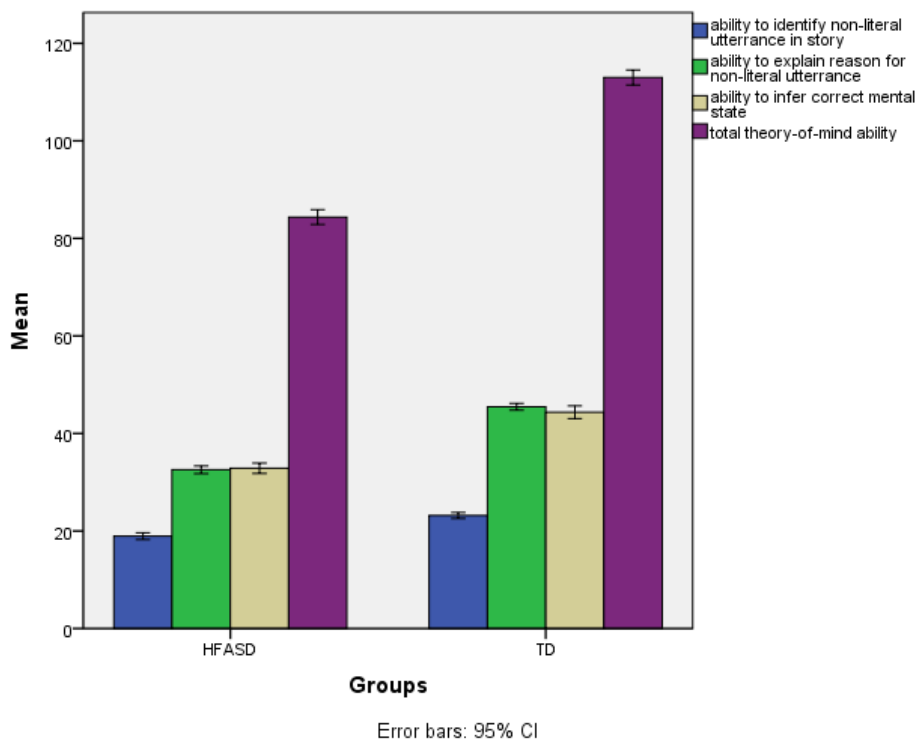


Figure 5.7: Difference in theory-of-mind ability scores between the HFASD and TD groups

Difference between the HFASD and TD groups on average TOM ability score was found to be significant, $t(df = 56) = -26.45, p < .001$. Similarly, on a sub-scale of

the Strange Stories task related to children's *ability to correctly identify the truthfulness of non-literal utterance in the stories*, the HFASD group (mean = 18.93, S.D. = 1.84) had a significantly lower mean than the TD group (mean = 23.18, S.D. = 1.61), $t(df = 56) = -26.93, p < .001, d = .96$ (see Figure 5.7). Also, the HFASD group (mean = 32.57, S.D. = 2.11) had a significantly lower mean for a sub-scale consisting of scores relating to children's *ability to explain the non-literal utterance in the story* compared the TD group (mean = 45.46, S.D. = 1.79), $t(df = 56) = -9.33, p < .001, d = .78$. Furthermore, the HFASD group (mean = 32.87, S.D. = 2.82) had a significantly lower mean score than the TD group (mean = 44.36, S.D. = 3.35) on the sub-scale to measure their *ability to infer advanced mental state of the central characters in the stories*, $t(df = 56) = -14.14, p < .001, d = .88$.

These findings provided support for the Hypothesis 2 of Study 1: that the HFASD group will have lower TOM ability scores than the TD group.

5.8 Correlation between TOM ability and appraisals (Research Question 2)

Key findings:

- All but one appraisal dimension of self-accountability had a significant correlation with the scores on TOM ability tasks in the HFASD and TD groups.
- The appraisals of motivational relevance and motivational incongruence had a negative association with TOM ability, while the other three appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and future expectancy had a positive association.

In order to investigate the degree and significance of the possible associations, correlation analyses, between each of the six appraisal dimensions and scores for the three TOM sub-scales obtained from responses to the 'Strange Stories', were carried out, separately for the HFASD and TD groups. The output is shown in Table 5.8.

Table 5.8.

Correlation between appraisals and TOM ability

Appraisal dimensions	HFASD group <i>r</i> (<i>p</i> value)			TD group <i>r</i> (<i>p</i> value)		
	TOM 1	TOM 2	TOM 3	TOM 1	TOM 2	TOM 3
Motivational relevance	-.29 (.03)	-.27 (.03)	-.30 (.03)	-.20 (.04)	-.22 (.03)	-.25 (.03)
Motivational incongruence	-.26 (.03)	-.25 (.03)	-.28 (.03)	-.18 (.04)	-.20 (.03)	-.26 (.02)
Emotion-focused coping potential	.21 (.04)	.26 (.03)	.23 (.03)	.19 (.04)	.22 (.03)	.21 (.03)
Problem-focused coping potential	.27 (.02)	.29 (.02)	.27 (.02)	.17 (.04)	.21 (.03)	.20 (.03)
Future expectancy	.40 (.01)	.43 (.01)	.42 (.01)	.30 (.02)	.31 (.02)	.29 (.02)
Self-accountability	-.10 (.07)	-.11 (.06)	-.12 (.06)	-.08 (.19)	-.11 (.20)	-.05 (.30)

Key: TOM1- sub-scale with scores indicating ability to correctly identify truthfulness of a non-literal utterance in the story; TOM2: sub-scale with scores indicating ability to correctly explain a non-literal utterance in the story; TOM3: sub-scale with scores indicating ability to infer correct mental state

As can be seen in Table 5.8, scores on all the three sub-scales of TOM ability were significantly associated with both the primary appraisal dimensions and three out of four secondary appraisal dimensions, in both the HFASD and TD groups. The direction of association between appraisals and the three subs-scales of TOM ability was same in both the groups. Specifically, the findings suggested that appraisal dimensions of motivational relevance, incongruence and self-accountability might be inversely related to the participant children's ability to infer the truthfulness of non-literal utterances in the stories, correctly explaining the nature of the non-literal utterances and infer related mental states of the central characters in the strange stories. In contrast, appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy had a linear association with such abilities. The association between the appraisal dimension of self-accountability and the three sub-scales of TOM ability were non-significant for the HFASD and TD groups.

These findings informed the Research Question 2 of Study 1: that all the three aspects of the construct of TOM ability are significantly associated with the appraisal dimensions of motivational relevance, motivational incongruence, emotion-focused coping potential, problem-focused coping potential and future expectancy, in both the groups.

5.9 Summary

This chapter presented descriptive and inferential statistic to investigate the hypotheses and exploratory research questions of Study 1. The results showed significantly different means for the HFASD group compared to the TD group for TOM ability, anxiety, fear and the six appraisal dimensions. Mixed ANOVA analyses showed the significance of group, action readiness and group x action readiness interaction effects for all the six appraisal dimensions. Significant correlations were also found for the appraisals with fear and anxiety; and between appraisals and TOM ability.

Chapter 6: Discussion Study 1

6.1 Introduction

This chapter will discuss Study 1 findings on differences between the HFASD and TD groups on fear, anxiety (Hypothesis 1), TOM ability (Hypothesis 2) and appraisal dimensions (Hypothesis 3), in relation to previous research. Difference in means of the specific appraisal dimensions across the three action readiness conditions (Research Question 1), association of appraisals with fear and anxiety (Hypothesis 4) and of appraisals with TOM ability (Research Question 2) will also be discussed.

6.2 Differentiation between the HFASD and TD groups

The HFASD group scored significantly higher than the TD group on the items relating to social and communication impairments associated with ASD, on the CAST scale (Scott et al., 2002). All children in the HFASD group also scored above the cut-off point of 15, specified by Scott et al., for an indication of autism-related symptoms and scores for the TD group were all below 15. Furthermore, no significant differences between the two groups were found on the vocabulary sub-test that indicates average IQ (see Section 4.6.7) in both the groups. Thus it can be inferred that children in the HFASD group had the symptoms related to autism and an average IQ. These findings suggest that children in the HFASD and TD groups were accurately classified.

6.3 Fear and anxiety scores in the HFASD group (Hypothesis 1)

Key points:

- The findings from Study 1 added further evidence to the existing literature by showing findings on significantly higher means for fear and anxiety in the HFASD group than the TD group.

The HFASD group had higher fear than the TD group as measured by the fear questionnaire, presented after the frustrating vignettes. The HFASD group also had higher anxiety than the TD group on the six sub-scales of SCAS (Spence, 1997): *panic attack and agoraphobia, separation anxiety, physical injury fears, social phobia, obsessive-compulsive and generalised anxiety*. These findings provided support for the Hypothesis 1 of Study 1.

It is well-documented in literature that children with HFASD exhibit fears and anxiety (Howlin, 2003; Siegel, 1996). Such negative emotions, if stable and persistent across time and contexts, are known to lead to emotional disorders and depression (Kalat & Shiota, 2006). Study 1 findings thus add further evidence to the existing literature that high fear and anxiety are experienced by children with HFASD.

6.4 Between group differences for the appraisal dimensions (Hypothesis 3)

Key points:

- Study 1 has provided a new finding into a relatively under-developed area of research: cognitive appraisals in children with autism, since significant between-group differences were found for each of the six appraisal dimensions.
- Specifically, the HFASD group had significantly lower mean scores than the TD group for the appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and future expectancy, but higher mean scores for self-accountability than the TD group; this was found across all the three action readiness conditions of the 'hypothetical frustrating vignette'.

Significantly different mean values were found for the six appraisal dimensions in the *no action readiness*, *preparing to advance* and *preparing to retreat* conditions of the ‘hypothetical frustrating vignette’, in both the groups. These findings supported the Hypothesis 3 of Study 1: The HFASD group maintained a significantly higher mean score for the appraisal dimensions of motivational relevance, motivational incongruence and self-accountability than the TD group across the three action readiness conditions. On the other hand, for the appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and future expectancy, the HFASD group had a significantly lower mean score than the TD group in all the three action readiness conditions of the ‘hypothetical vignette’.

These findings provided new insights into a relatively scant area of research – cognitive appraisals in children with HFASD and also provided empirical support for the Hypothesis 4 of Study 1: The HFASD group had significantly different scores than the TD group for the six appraisal dimensions. The finding of high appraised relevance and incongruence in the HFASD group indicates the possible contribution of impaired appraisals to the experience of excessive negative emotions in the HFASD group. Although, appraisals of high motivational relevance and motivational incongruence have been shown to be essential for the occurrence of negative emotions (Smith & Lazarus, 1993), still a secondary appraisal is crucial for the emotion to be actually felt.

The findings on secondary appraisal dimensions suggested that the HFASD group made appraisals of higher self-accountability, low emotion and problem-focused coping potential and low future expectancy in the frustrating vignettes compared to the TD group. The appraisal of future expectancy in accordance with the structural

appraisal model by Smith and Lazarus (1993) is defined as a general anticipation about the desirability of the outcome of a situation. Self-accountability refers to the extent to which personal responsibility for a situation is taken, emotion and problem-focused coping potential indicates the belief in one's own ability to deal with the demands a negative situation might present. These findings thus suggest that in the negative social situations, which were appraised as high in personal relevance and incongruence, the HFASD group had low expectancies about the outcome, low confidence in their ability to deal with the adverse consequences of that situation and took higher responsibility for the 'hypothetical frustrating vignette'.

Specifically, the appraisals related to inflated self-blame have been proposed as faulty cognitions (Freeston, Rheaume, & Ladouceur, 1996; Salkovskis, 1985) and have been shown to be significantly associated with excessive anxiety (e.g., Rheaume, Ladouceur, Freeston, & Letarte, 1995; Rassin, Muris, Schmidt, & Merckelbach, 2000). Again, although no evidence on cognitive appraisals in an HFASD sample has been published, the appraisal of low future expectancy has been shown to be associated with anxiety and other negative affect in children who present clinical levels of anxiety (Thorpe & Salkovskis, 1995). The appraisal of coping potential has also been shown to be a common cause of anxiety and social difficulties in children from families with inter-parental conflict (Grych, Harold, & Miles, 2003). These findings suggest that appraisals might be crucial in understanding fear and anxiety. Such a profile of appraisals has been shown to be associated with not only negative emotions but also social difficulties (e.g., Grych et al., 2000; Kerig, 1998). It is already known that children with HFASD exhibit social difficulties and indeed, the HFASD group were also found to have excessive fear and anxiety in Study 1.

The findings on impairment in appraisals in the HFASD group are therefore useful in further investigation of the possible association between appraisals of coping potential, self-accountability and future expectancy with fear and anxiety difficulties, in children with HFASD (discussed in Section 6.6). It should however be noted that the structural appraisal model that was assessed in the current study has been argued to be limited in its scope for explanation of emotional experience since additional automatic process, which might occur at the unconscious level were found to contribute to the occurrence of emotional feeling (Chartrand, van Baaren, & Bargh, 2006; Smith & Kirby, 2001). This issue is further discussed in Section 15.9.5 in Chapter 15. Nevertheless, the appraisal dimensions as measured in the current study have a significant role to play in the experience of fear. Therefore, the present findings if supported with further research may further our understanding about what contributes to the emotional problems commonly experienced by children with HFASD.

6.5 Difference in the scores on appraisals across the three action readiness conditions (Research Question 1)

Key points:

- The findings from Study 1 suggested possible associations between the participants' action readiness tendencies and related appraisals in the hypothetical frustrating vignette, since a significant difference in the mean scores of each of the six appraisals, across the *preparing to advance* and *preparing to retreat* conditions were found.
- Previous research has suggested similar relationships in other groups without autism, but this is a new finding for children with HFASD and thus offers new directions for further investigation in future research.

Difference in mean scores between the three action readiness conditions of the six appraisal dimensions across the HFASD and TD groups were different, as indicated by the significance of the interaction effect between action readiness and type of

group. Specifically, the difference in means between the *no action readiness* and *preparing to advance* conditions for all appraisal dimensions, except for motivational incongruence, seemed to be greater in the HFASD group than the difference between the same two conditions, in the case of the TD group. On the other hand, for all the appraisal dimensions, except for motivational incongruence, the difference between the *no action readiness* and *preparing to retreat* conditions were smaller in the HFASD group than the difference between the same two conditions in the TD group. This finding could suggest that the HFASD group were less sensitive to the *preparing to retreat* condition or it could be indicative of their resistance to continuous change.

These findings also suggest that the degree of perceived emotional action readiness in a situation might be negatively associated with the appraisal dimensions of motivational relevance, motivational incongruence and self-accountability since in the *preparing to advance* conditions, mean scores of these three appraisals appeared to be smaller than the *no action readiness* condition in both the groups, alike. On the other hand, means of the other three appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy, seemed to be directly associated with action readiness in the hypothetical vignettes as the means were higher in the *preparing to advance* condition, but lower in the *preparing to retreat* condition compared to the *no action readiness* condition. The only exception to this trend in the scores was in the case of self-accountability scores of the HFASD group, whereby scores in the *preparing to advance* condition seemed to be higher than mean values in the *no action readiness* condition. Also, mean scores of problem-focused

coping potential in the *preparing to retreat* condition appeared to be higher than these scores in the *no action readiness* condition in the HFASD group.

The type and degree of perceived emotional action readiness by the participant children in HFASD group therefore seem to be associated with the extent to which the children held themselves responsible for the hypothetical vignette, their expectancies and confidence of dealing with it. Studies for groups other than HFASD have also shown a significant effect of the manipulation in participants' emotional action readiness on appraisals of relevance, other-blame, coping potential and future expectancy (e.g., Frijda et al., 1989). The novel and important finding here is that specific cognitions can be manipulated in children with HFASD too, which might subsequently lead to an improvement in the relevant cognitive appraisals. The selective appraisals of relevance, incongruence, future expectancy, coping potential and self-accountability have previously been discussed in relation to childhood psychopathology, especially anxiety and depression (Freeston et al., 1996; Frost & Stekette, 1997; Macleod & Rutherford, 1992). Since Study 1 showed significantly different mean scores for the six appraisal dimensions in the three different manipulated action readiness conditions of the hypothetical vignette, these findings provide important and new directions for future research and have the potential implications for the designing of intervention programmes to improve the social well-being of children with HFASD. These findings however need to be interpreted with caution, since the levels of action readiness were not directly assessed and so, the ecological validity of this approach could not be established in Study 1. This will be further discussed in Section 6.10.4.

6.6 Correlation of appraisal dimensions with fear and anxiety (Hypothesis 4)

Key points:

- Another new finding from Study 1 was related to significant association of the six appraisal dimensions with fear and anxiety scores in the HFASD group.
- Similar associations have been consistently found by previous research in other groups of children and adults without autism, so this novel finding for the HFASD group is useful for future research investigations.

The findings from Study 1 provided new insights into how appraisals might be associated with fear and anxiety in the HFASD group. For the HFASD group, there were significant associations between fear and all the six appraisal dimensions; and significant associations between anxiety and appraisal dimensions. These findings provided support for the Hypothesis 4 of Study 1: that there were significant associations between fear and the six appraisals, and anxiety and appraisals in the HFASD group. However, for the TD group, the only significant correlations were between fear and the two primary appraisals of motivational relevance and motivational incongruence; and between fear and emotion-focused coping potential. None of the other fear-appraisal or anxiety-appraisal correlations were significant in the case of the TD group.

These results indicate two interesting and novel findings: first in consensus with previous research findings from other groups of children (e.g., Sheets, Sandler, & West, 1996, also see Table 3.2), appraisals in the HFASD group were associated with fear and anxiety. Second, not only were there significant associations between fear, anxiety and appraisals, but these correlations were also significantly different between the HFASD and TD groups. The findings for the TD group fully support the structural model by Smith and Lazarus since only the three appraisal dimensions of

motivational relevance, motivational incongruence and emotion-focused coping potential showed significant correlations with fear. Also, as reported by Smith and Lazarus there was a positive association of fear with the primary appraisals of motivational relevance and incongruence, and a negative association with the secondary appraisal of emotion-focused coping potential in the case of the TD group.

For the HFASD group, on the other hand, the findings of more than one secondary appraisal dimension being associated with fear were different from Smith and Lazarus's (1993) model, in which only emotion-focused coping potential was proposed to be predictive of fear. In Study 1, the appraisal of emotion-focused coping potential was indeed associated with fear in the HFASD group, but in addition, the appraisals of problem-focused coping potential, future expectancy and self-accountability also had significant correlations with fear. Consistent with Study 1 finding, a research study by Nezlek, Vansteelandt, Mechelen and Kuppens (2008) also questioned the claim of Smith and Lazarus that only one secondary appraisal is associated with the basic emotions, since they too found evidence for more than one appraisal to be responsible for negative affect in a typically developing group. It could be the case that the appraisal model and the claim that only one unique secondary appraisal is predictive of fear is not generalisable to all groups; and that it needs to be modified for the HFASD group.

The appraisal dimensions were also found to have significant associations with the average anxiety score obtained through administration of the SCAS (Spence, 1997) scale in the HFASD group, but not in the TD group. Specifically, the findings for HFASD group showed significant positive correlations between appraisals of motivational relevance, motivational incongruence, self-accountability and the

average anxiety score. The correlations were however negative between the anxiety score and appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy. This suggests that in the situations characterised by high appraisals of motivational relevance, incongruence and self-accountability, anxiety occurrence may as well be high in the HFASD group. In contrast, the occurrence of anxiety symptoms may be low in the situations perceived as high in appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy. Similar correlations were found between these appraisal dimensions and fear in the HFASD group.

These findings indicate that in the negative, frustrating social situations, the appraisals related to low expectations about the outcome, taking excessive responsibility for the negative situation and low confidence in one's own ability to deal with the adverse consequences of a situation might be associated with fear and anxiety in the HFASD group. Cognitive appraisals thus seem to be of relevance when discussing fear and anxiety in children with HFASD. These novel findings for the HFASD group contribute towards our understanding about the experience of excessive fear and anxiety in children with HFASD by suggesting possible links with appraisal dimensions. The findings also provide new directions for future research studies aimed at understanding emotional difficulties in children with HFASD.

6.7 Is theory-of-mind ability associated with appraisal dimensions? (Research Question 2)

Key points:

- TOM ability has been extensively investigated in previous research studies, but there are no other studies on cognitive appraisals in autism, so the new finding from Study 1 on the significant association between TOM ability and appraisal dimensions offers interesting, preliminary insights.

The findings informed the Research Question 2 of Study 1 that TOM ability will have a significant association with appraisal dimensions in the HFASD group. TOM ability had a significant and positive correlation with the appraisal dimensions of motivational relevance, motivational incongruence, emotion-focused coping potential, problem-focused coping potential and future expectancy in the HFASD and TD groups. This finding indicated that appraisals, *i.e.* the evaluation of social situations in relation to personal goals, needs and abilities might be associated with TOM ability, *i.e.* the ability to understand the thoughts, perspectives and intentions of another person in a social situation. This could also suggest that an incorrect understanding of other person's thoughts in a social situation (caused due to TOM deficits) by children in the HFASD group might co-occur with faulty appraisals in the same situation. Although, from these associations alone, the direction of the relationship between TOM ability and appraisals cannot be inferred, but the findings from Study 1 indeed provide a starting base for further research into how a lack of ability in the understanding of other people's intentions in a social situation may be associated with appraisals.

Motivational relevance and incongruence are the primary appraisal dimensions that are known to be essential for the occurrence of the basic negative emotions

(Smith & Lazarus, 1993). In Study 1, these two appraisals had a negative association with TOM ability in the HFASD and TD groups. On the other hand, the secondary appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy that are known to be positively associated with the basic positive emotions (Smith & Lazarus, 1993) had a positive association with TOM ability. These findings imply that in situations with high scores on TOM ability tasks, the scores on the primary appraisal dimensions of motivational relevance and incongruence might be relatively lower, while the scores on the secondary appraisals relating to coping potential and expectancy about the future outcome of a situation might be high in both the groups. It also suggests that in such situations with high scores on the TOM ability tasks, there might be relatively less occurrence of negative emotions such as fear. The investigation of such a mediation relationship between appraisals, TOM ability and fear might be a relevant area for future research.

6.8 Limitations in Study 1 and directions for Study 2

6.8.1 Representativeness of sample: Since only 4% of the families contacted for the recruitment of the HFASD group and only 20% for the TD group agreed to take part in this study, the present sample may not be representative either of families with a TD child or a child with HFASD. It was not possible to assess whether there were differences between the families who agreed and who did not agree to participate in Study 1. However, all the study participants were administered the CAST scale that is designed to identify children at the risk of developing or living with the ASD symptoms. The scores obtained here for the HFASD and TD groups were similar to the recommended range of scores for groups with and without autism by Scott et al. (2002), who carried out research to standardise the CAST scale. So, it can be

argued that children assessed in Study 1 were somewhat representative of the general population of children with HFASD/TD in terms of their CAST scores.

6.8.2 Only fear and anxiety were studied: In Study 1, the HFASD group was found to have a higher mean value for fears and anxiety than the TD group. Further, the HFASD group in Study 1 was found to have a significantly lower mean value for the appraisals of future expectancy, emotion-focused coping potential and problem-focused coping potential, but a higher mean value for self-accountability compared to the TD group. Smith and Lazarus's (1993) model proposed that it was the specific secondary appraisal dimension that determines the unique emotional experience. However in Study 1, the secondary appraisal dimensions of future expectancy, problem-focused coping potential, emotion-focused coping potential and self-accountability were all found to be significantly correlated with both fear and anxiety.

Study 1 findings therefore suggest that there might be more than one secondary appraisal dimensions associated with fear and anxiety in the HFASD group. It is therefore important for Study 2 to examine underlying appraisal dimension for other negative emotions such as guilt and sadness, which were not investigated in Study 1, in order to see if this is the case for other negative emotions too; and whether the structural appraisal model as stated, is applicable to children with HFASD or not.

6.8.3 Use of hypothetical frustrating vignette: Study 1 used the 'hypothetical frustrating vignette' tool, whereby the participants were asked to read stories depicting the three levels of emotional action readiness. So, it is possible that when the same children are in real situations, where there is high or low action readiness

they need not necessarily respond in the way that they have indicated in response to these vignettes, since they may not have been able to accurately report what they would do or how they would react in a real situation of the similar nature.

Hypothetical vignette is also an imagery technique and is therefore likely to have required TOM ability. A well-established finding from previous research and also supported by Study 1 data is that children with HFASD have poorer TOM ability than TD children. The HFASD group's performance in Study 1 on the 'hypothetical vignette' might have therefore been influenced by their TOM limitations. Study 2 will aim to confirm the finding of Study 1 on the appraisal-fear relationships by applying a technique less reliant on TOM abilities.

Also, one of the four hypothetical frustrating vignettes used in Study 1 required the participating children to imagine being in an argument with their big sister. Not all children who participated in Study 1 had an older sister, so, there could be a potential bias in the responses of children who did not have an older sister, compared to children who had, depending on their relationship with their sister. There is also a danger that the hypothetical vignette that was presented at the time of Study 1 could have evoked the memory of a past situation in children with an older sister at home, and the responses could have thus reflected their past thoughts and memories, instead of the current thoughts that evoked their imagination in the hypothetical vignette presented during the testing session. To minimise such an error, data on the number and the gender of siblings of the participants in both the groups was collected and analysed for significance of any differences. No significant differences were found between the HFASD and the TD groups for the gender of siblings and thus the chances of such a bias occurring in Study 1 are low.

6.8.4 Action readiness not measured directly: Since perceived state of emotional action readiness was not measured directly in Study 1, it was not possible to comment whether it was actually action readiness that was associated with difference in scores of the appraisal dimensions across the three action readiness conditions. Measuring action readiness would have helped to establish ecological validity of the technique of the hypothetical vignettes consisting of the three action readiness conditions.

These methodological limitations draw attention to the need to interpret the results from Study 1 with caution. Nevertheless, this was the first study of appraisal dimensions and their association with fear in children with HFASD; and as such it has the potential to serve as a starting base for further studies relating to the role of appraisals in predicting negative emotions and social difficulties in children with HFASD. Based on the identified limitations above, Study 2 will re-investigate appraisals through narrative recall, a technique that might be less dependent on TOM ability. The negative emotions of guilt and sadness, as well as fear, will also be investigated in relation to the appraisal dimensions to assess the extent to which the structural appraisal model can be applied to understand the appraisal-emotional relationships in the case of the HFASD group.

6.9 Summary

Study 1 findings showed that the HFASD group may have impairment in the appraisal dimensions, such that they appraised the ‘hypothetical frustrating vignette’ as high in motivational relevance, motivational incongruence, self-accountability, but low in emotion and problem-focused coping potential and future expectancy compared to the TD group. Such a profile of appraisal dimensions was also found to

be associated with fear and anxiety in the HFASD group. Another important finding from Study 1 was that the HFASD and TD groups differed in their response to the three action readiness versions across the *preparing to advance* and *preparing to retreat* conditions of the ‘hypothetical frustrating vignette’ technique.

Chapter 7: Appraisal, coping and negative affect in children with HFASD -Literature Review Study 2

7.1 Introduction

This chapter will present a rationale for the examination of two new variables in Study 2: coping strategies and social adjustment. In addition, based on the limitations and directions identified in Study 1, an additional set of hypotheses and research question for investigation in Study 2 are proposed.

7.2 History and definitions of coping

Alongside appraisal dimensions, study of coping has also been shown to be crucial for the examination of social difficulties in children and adults without autism. The earliest definitions of coping emerged predominantly from the psychoanalytic literature, which construed it as a defence mechanism to protect one's psychological health from external and internal threats. This Freudian approach viewed coping as consisting of specific psychological responses to specific threats or stressors in order to prevent psychopathology in humans. This trait approach (Holzman & Gardner, 1959; Rapport, Gill & Schaefer, 1945) was however argued to be too narrow, since a reliable measurement of the intra-psychic processes was found to be difficult (Lazarus, 1993). This psychoanalytic theory also lacked empirical validity for the proposed close association between the specific forms of psychological conflicts and specific defensive styles in real life observations (Billings & Moos, 1981; Sjoback, 1973).

Led by such criticisms, the trait approach was revised in the 1970s leading to the development of a new hierarchical abstraction of coping, which attempted to differentiate coping behaviour from psychological defences, in terms of their effectiveness in maintaining an individual's physical and emotional well-being (Haan, 1969; Meninger, 1954). These theorists proposed a tripartite hierarchical structure, whereby coping behaviours were considered to be the most advanced and competent. On the other hand, psychological defences were seen as regressive and less healthy (Vaillant, 1977). For example, active coping behaviours involving some action at the behaviour or thinking level were considered healthy, but the defences like rejection were regressive for social development. Since this approach also retained the concepts about psychological defences, it was criticised for the similar issues of difficulty in measurement (Lazarus, 1993). Addressing such flaws in the coping theory, later theorists proposed coping to be neither a defensive style nor an entity in a hierarchical model, but rather a process.

Study of coping as a process was heavily influenced by the work of Lazarus (1966). According to Lazarus, coping was not just a specific response to a specific stressor, but was more diverse and complex in its structure with the aim of protecting one's emotional, social and physical functioning. Lazarus followed this up with further research studies aimed specifically at studying the dynamic nature of coping (e.g. Folkman & Lazarus, 1980; Lazarus & Launier, 1978; Pearlin & Schooler, 1978; Stone & Neale, 1984). Lazarus and Folkman (1984) defined coping as "*constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands appraised as taxing or exceeding the resources of a person*" (p. 141). They emphasised that only deliberate efforts to deal with the demands of a

situation should be classified as coping behaviours and all other behaviours, which are instinctive or outside a person's control should be excluded. They also argued that all the coping attempts initiated by an individual in response to a threat or challenge in the environment should be included in the category of coping behaviours, irrespective of whether they are successful or not. It was argued that there are kinds of coping responses individuals may use in their daily life and that different coping choices differ in the extent to which they lead to successful social adaptation.

7.3 Types of coping

Coping has been delineated to serve two main functions (Lazarus & Folkman, 1984): first, to try and reduce the harm induced by a stressor by directly acting on it; and second to deal with the emotional consequences, manage one's own emotional state and stay calm. Referring to these functional differences, a distinction between problem-focused and emotion-focused coping has been made. Problem-focused coping is defined as the efforts to manage or alter the stressor, and emotion-focused coping is defined as the efforts to deal with one's own emotional reactions. It was further proposed that people who employ problem-focused coping strategies are better adjusted to varied stressful situations than people who employ emotion-focused coping strategies. This hypothesis has been empirically supported (Billings and Moos, 1984; Fairbank, Hansen and Fitterling, 1991).

In a similar vein, although adopting a different methodology, Roth and Cohen (1986) proposed approach and avoidance as two different types of coping in stressful situations. Approach coping is defined as an engaged form of coping with the goal of reducing, eliminating or managing the internal or external demands of a stressor,

which can be argued to be theoretically comparable to the definition of problem-focused coping. Avoidance coping was compared to emotion-focused coping, since both involve attempts aimed at directing all the efforts away from a stressor. Like the former system, there is research evidence (Causey and Dubow, 1992) to support the potential utility and validity of the classification system by Roth and Cohen.

These two systems however differed in their approach for proposing the two sub-types of coping, while Roth and Cohen (1986) adopted a theoretical approach in developing their coping system, Lazarus and Folkman (1984) followed a more empirical approach. Roth and Cohen's theoretical approach consisted of first identifying the common ways in which people dealt with stressors by undertaking a review and content analysis of the available literature. Then individual items, relating to those specific sub-categories of coping were formulated. On the other hand, Lazarus and Folkman's approach was more empirical in that they first interviewed a group of participants about their usual ways of dealing with stress and from that data, specific themes of coping strategies were identified using factor analytic techniques. Further, it can be argued that Lazarus and Folkman's initial description offered division according to the focus of coping efforts (situation versus one's own emotions), while Roth and Cohen's classification system proposed sub-types according to the manner in which individuals attempt to deal with a stressful situation: approach or avoidance.

Moos (1988) compared these two classification systems and also pointed out that both the frameworks delineate similar concepts, but in a different fashion, with regard to their criteria for proposing the sub-types of coping. The two classification systems were however identified to have more similarities than differences in the

proposed sub-types of coping. Approach coping in Roth and Cohen's system was argued to be similar to problem-focused coping strategies, since both are known to serve adaptive functions. On the other hand, avoidance coping strategies were comparable to emotion-focused coping strategies, which usually leave a person poorly adjusted (Moos, 1988, Peterson, 1989).

7.4 Coping and social adjustment

Research studies have shown that the ability to use appropriate coping strategies to manage stress is adaptive in children from socially difficult backgrounds and in children with psychological distress. An illustrative summary of studies showing an association between coping and social-emotional difficulties is presented in a chronological order in Table 7.1.

Table 7.1.

Child studies showing coping and emotional difficulty outcomes

Authors	Sample size	Age	Findings
1. Burstein & Meichenbaum (1979)	20 children undergoing minor surgery	7-12 years	Children who used active and problem-focused coping reported minimum difficulties whereas, children who used avoidance had maximum stress and difficulties with social adjustment
2. Siegel (1981)	70 children	8-14 years	Children who sought more information about medical procedures had less distress in response to medical procedures than children who tried avoiding social situations
3. Rossman (1992)	345 children	6-12 years	Avoidance/ distraction coping strategies damaged self-worth under high stress conditions, problem-solving coping associated with better social functioning

Authors	Sample size	Age	Findings
4. Sandler et al. (1994)	258 children whose parents had divorced	7-13 years	More active coping predicted less depression, in cross-sectional analysis avoidance positive related to depression while active coping was negatively associated.
5. Unger et al. (1998)	423 homeless youths	13-23 years	Emotion-focused coping positively correlated with depression and alcohol disorder, problem-focused coping had negative association
6. Herman-Stahl & Peterson (1999)	471 children	11-12 years	In cross sectional analysis greater approach associated with less depression
7. Recklitis & Noam (1999)	302 psychiatric inpatients	12-16 years	Avoidance positively associated with externalising problems such as aggression and conduct problems.

As can be seen in Table 7.1, despite studying different groups of children in different sample sizes from varied backgrounds and a wide age range, coping strategies were always found to be significantly associated with emotional well-being and social adjustment. For example, three studies in Table^{1,2,7} investigated coping in the groups of children receiving some kind of medical attention. All the three studies found a positive association between avoidance coping with stress and other social adjustment related difficulties. Approach coping on the other hand, had a negative association with the social-adjustment difficulties.

Research studies with children from other socially challenging backgrounds such as parental divorce⁴ and homelessness⁵ also found that children who often engaged in avoidance coping reported higher symptoms of depression and other psychological problems. Further studies carried out with the TD groups of children^{3,6} also found that the use of approach and problem-focused coping strategies are negatively, but of avoidance coping positively associated with social adjustment.

These studies with groups of children without autism thus suggest that avoidance coping might be associated with a range of social difficulties and the use of approach coping possibly led to emotional well-being. In the same context of the relationship between coping and social adjustment, a distinction between effective and non-effective coping in terms of an individual's ability to shift their coping strategies depending on the environmental demands has also been proposed (Zeitlin & Williamson, 1985). Thus, making appropriate choice of coping tailored carefully to the challenges of a given situation might be important.

It was also argued that people tend to develop such coping styles over time for dealing with an event (Zeitlin, 1985). These coping styles are acquired naturally during development and by adulthood, TD people usually develop a repertoire of coping strategies that help them deal with the diverse situations and adversities in the environment (Zeitlin & Williamson, 1990). Similarly, Lazarus and Folkman (1984, 1987) asserted that people usually acquire an understanding of the coping-outcome relationship by direct experience with stressful encounters, where they are given an opportunity to exercise control and manipulate the outcomes. This way they learn about their own strengths and weaknesses, understand the kind of challenges different situations may present and develop, and master more effective coping skills.

Research on the coping choices of children exhibiting learning disabilities suggest that because of their physical and cognitive impairments, they might fail to develop a range of coping strategies (Kamann & Wong, 1993; Lewis & Doorlag, 1995). Similarly, in the case of children with autism, who are already known to exhibit developmental delays and social impairments, the difficulty in learning adaptive coping skills might be experienced. These children may never have the opportunity

to learn such skills through direct experiences as they have limited experience of facing challenging situations on their own (Tantam, 2000). Parents often tend to raise children with autism in highly protected environments, which may then deprive them of the training required to learn effective coping skills and give them little control over their lives (Shulman, Carlton-Ford, & Hed, 1995).

7.5 Coping in children with autism

There is limited research evidence on how children with autism manage their excessive anxiety and stress, and the findings suggest that they might not be using the best coping strategies. For example, Gupta and Sharma (2005) studied coping choices of children with high-functioning autism and found they frequently used avoidance and passive coping strategies for management of fear. Konstantareas and Stewart (2006) found that children with AS used non-adaptive affect regulation strategies like emotion-focused coping in a stereotyped, repetitive behaviour to manage adverse social situations compared to a group of TD children.

In addition, the coping choices of children with autism have been argued to be mostly focused on their negative emotions and involve attempts aimed at regulating their anxiety in particular (Siegel, 1996). Similarly, it has been argued that common behaviours characterised by extreme shyness with strangers, self-isolation, obsessions and compulsions in children with autism are aimed at reducing the sense of uncertainty and bringing a sense of order to their surrounding environment (Delfos, 2005). Use of avoidance coping to manage social anxiety was also mentioned by Baron-Cohen, Groden, Groden and Lipsitt (2006). Kanner (1943) stated that children with autism use repetitive patterns of behaviour as defences against high anxiety, suggesting that the avoidance patterns of coping have been

noted in behaviour of children with autism from the early days of the study of this topic.

From the above, it can be seen that repetitive avoidance of social situations, especially anxiety-inducing situation, seems to be the most commonly mentioned coping strategy used by children with autism. This is however, largely based on theoretical arguments and observations from case studies; only two research studies (Gupta & Sharma, 2005; Konstantareas & Stewart, 2006) have carried out an empirical investigation of coping in children with HFA and AS. Children with autism are already known to exhibit difficulties with social adjustment (Attwood, 1998). So, in order to help improve the social and emotional well-being of children with autism, more empirical evidence is needed. Coping also merits investigation because it has been shown to be associated with appraisals, which were found to be impaired in the HFASD group in Study 1.

7.6 Appraisal dimensions and coping

Lazarus and Folkman (1987) have argued that the appraisal of one's coping efficacy is predictive of coping choices in individuals. They further argued that coping strategies are enabled in response to the appraised threat/ challenge in environment with the aim of reducing the impending harm. If the enabled coping strategy is in harmony with the appraisal dimensions, the coping attempts are successful, adaptation is achieved and the child functions effectively. Since there are no studies that investigated the appraisal-coping relationship in children with autism, Table 7.2 provides an illustrative summary of research with children who have the experience of developmental and social challenges in a chronological order.

Table 7.2.

Studies showing association between appraisals and coping

Authors	N of participants	Age	Findings
1. Causey & Dubow (1992)	481 children	7-11 years	Approach coping had positive, but avoidance had negative correlations with the appraised competence and controllability
2. Grych & Fincham (1993)	Study 1: 45 children; Study 2: 112 children	11-12 years	Appraisal of coping potential, self-blame negatively associated with withdrawal coping, but positively with approach coping
3. Gamble (1994)	146 children	10-11 years	Appraisals of high controllability, high future expectancy, low self-blame positively associated with avoidance coping, but negative with approach coping
4. Lengua and Sandler (1996)	199 children (divorce of parents)	8-12 years	Children who had higher appraised coping potential used higher approach coping and were also better adjusted
5. Rogers and Holmbeck (1997)	80 children- (inter-parental aggression)	7-12 years	Children who had lower appraisals of coping potential and expectancy used ineffective coping strategies.
6. Kliwer et al. (1998)	215 children	9-12 years	Appraisals of self-blame positively associated with avoidance coping; appraisal of coping potential and expectancy negatively with avoidance, but positive with approach coping

As shown in the Table 7.2, three studies^{2, 3, 5} showed that the appraisal dimensions of future expectancy and coping potential were directly predictive of approach coping. However, children who made low expectations about the outcome and had low coping potential, reported use of avoidance coping more frequently. In these studies, appraisal of self-blame was also found to be directly predictive of avoidance coping in situations of inter-parental aggression and parental divorce. Two other studies^{1, 4} also showed a negative association between avoidance coping and

appraised coping potential. These findings suggest that children who had higher appraisals of coping potential and positive expectations about the outcome, *i.e.* high appraisals related to future expectancy reported a greater use of the approach forms of coping. In such cases, they also reported less frequent use of avoidance coping, which also had no significant effect on social adjustment, but a higher use of avoidance coping did. Consistent with this view, significant association between appraisals and coping attempts of TD children⁶ has also been reported.

Experiencing parental divorce or inter-parental aggression is of course quite different from having an autism spectrum disorder, but both the groups of children might be considered to be living with social and developmental vulnerabilities; allowing these findings to serve as the useful starting base for further research into the relationship between appraisals and coping in children with autism. Previous research studies have already shown that children with HFA and AS use avoidance patterns of coping (Gupta & Sharma, 2005; Konstantareas & Stewart, 2006). It may thus be the case that in group of children with autism too, appraisals related to self-accountability, future expectancy, emotion-focused coping potential and problem-focused coping potential might be associated with avoidance coping.

7.7 Overview of research design of Study 2

Study 2 develops the work of Study 1 in the following ways:

1. In accordance with the literature review presented above, a new variable of coping strategies in both HFASD and TD groups will be studied (for a rationale see Section 7.4 & 7.5).

2. The new variable of coping will be investigated in relation to the appraisal dimensions in both the HFASD and TD groups (see Section 7.6).
3. Further in order to address the limitations identified in Study 1 (see Section 6.8.3), Study 2 aims to investigate appraisal dimensions in children with HFASD using a non-imagery technique this time.
4. Study 2 will examine appraisals in relation to the three negative emotions of fear; guilt and sadness, instead of only fear and anxiety (see Section 6.8.2).
5. Unlike Study 1, in Study 2 only the secondary appraisal dimensions of emotion-focused coping potential, problem-focused coping potential, future expectancy and self-accountability will be studied, since the primary appraisal dimensions of motivational relevance and motivational incongruence are the common underlying appraisals for all the three negative emotions. It is the unique secondary appraisal dimension that singles out the experience of one specific negative emotion (Smith and Lazarus, 1993).
7. In Study 2, a relatively larger sample will also be recruited that will allow regression analysis to be carried out for an investigation of the underpinning appraisal dimensions to the three negative emotions.

7.8 Hypotheses and Research Questions for Study 2

The aim of Study 2 is to investigate association of cognitive appraisal dimensions and avoidance coping with the commonly experienced negative emotions by children with HFASD. The hypotheses for Study 2, formulated based on previous research and the limitations identified in Study 1, are as follows:

Replicated Hypotheses

1. The HFASD group will have a higher mean for the appraisal dimensions of self-accountability, but lower means for emotion-focused coping potential, problem-focused coping potential and future expectancy compared to the TD group.
2. The HFASD group will have significantly higher means for the negative emotions of fear, guilt and sadness compared to the TD group.

New Hypotheses

3. The HFASD group will score higher for avoidance coping, whereas the TD group will score higher for approach coping.
4. The appraisal dimensions of self-accountability, emotion-focused coping potential, problem-focused coping potential and future expectancy will be significantly associated with the negative emotions of fear, guilt and sadness in the HFASD group.
5. Avoidance coping will have a significant association with social difficulties in the HFASD and TD groups.

Research Question

1. Are the appraisal dimensions of self-accountability, emotion-focused coping potential, problem-focused coping potential and future expectancy significantly associated with avoidance coping in the HFASD and TD groups?

7.9 Summary

This chapter proposed seven hypotheses aiming to examine between-group differences and association between the appraisal dimensions, negative emotions, social difficulty and coping, using an improved methodology, consisting of the technique of narrative recall and a relatively larger sample size than Study 1. Further, theoretical background to provide a rationale for the inclusion of four new variables of guilt, sadness, coping and social difficulty was also presented.

Chapter 8: Methodology Study 2

8.1 Introduction

This chapter presents a research design developed to test the Hypotheses and Research Questions for Study 2, stated in Section 7.8. This chapter also describes the participant recruitment procedures for Study 2, self-report scales, interview schedules and narrative recall techniques used. Preliminary analyses to check data characteristics are also presented.

8.2 Sample size and selection procedure: for Study 2

Request for participation in Study 2 was sent to the families who took part in Study 1, in both the HFASD and TD groups. In addition, new families through the National Autistic Society, local schools and voluntary organisations were also sent a request for participation in Study 2; procedures for which will be described below. Before contacting any new families with a child with HFASD or a TD child, necessary ethical permissions were obtained from the Ethics Committee of the University of Strathclyde (Reference number: UEC0809/42) and the National Autistic Society. In total, 42 children in the HFASD group and 40 TD children were recruited for Study 2. Out of these, 25 children in the HFASD group and 22 in the TD group had already been participants in Study 1. The potential bias in the recruitment of sample due to a potential difference between the parents from Study 1, who decided to take part in Study 2 and those who did not, will be tested in Chapter 9, Section 9.2.4.

The parents of children in the HFASD group who participated in Study 1 were sent two sheets, one summarising the results from Study 1 (see Appendix 16) and a

second information sheet (see Appendix 17) to invite their participation for Study 2. Similarly, the parents of children in the TD group, who took part in Study 1, were also invited to take part in Study 2 (see Appendix 18). There was a gap of six months between Studies 1 and 2. Unlike the respondents in the HFASD category, they were not sent the sheet summarising the results from Study 1, as those might not have been of interest to them. They were informed that the results of Study 1 were available on request, but no parent asked to see them. New families with a child with HFASD and a TD child were also sent the information sheets (see Appendix 17 and 18) to invite their participation in Study 2. Study 1 results were also offered to them on request. A separate information sheet (see Appendix 19) was also enclosed for children. The request was sent both by post to each parent's address (with stamped self-addressed envelope) and by email. New respondents in the HFASD and TD groups were also entered in a draw for a foot spa.

One aim of Study 2 is to re-examine some hypotheses from Study 1 with a larger sample size in order to be able to carry out regression analyses to assess the relationship between the variables of appraisal, coping, negative emotions and social difficulties. The minimum sample size requirement for carrying out a regression analysis is 10 times the number of predictors (Field, 2006). As at least three secondary appraisal dimensions were found to be significantly associated with fear and anxiety in Study 1, in order to test the appraisal-emotion relationship, more than 30 participants are required. A larger sample of 40 children in the TD group and 42 children in HFASD group was therefore recruited in Study 2. This sample size was also considered sufficient for other analyses, such as correlation and *t*-tests, based on the power analyses discussed in Section 4.2.2 in Study 1. The same inclusion criteria

as used in Study 1 were used for the selection of participants in Study 2 (see Section 4.2.1).

As stated above, new participants for Study 2 in the HFASD and TD groups were recruited through five main sources: the National Autistic Society (NAS); mainstream and special units of schools in Glasgow, North Lanarkshire, Renfrewshire and Edinburgh, parent support groups and from the University of Strathclyde campus.

8.2.1 National Autistic Society (NAS): Similar to the procedure followed for Study 1, 75 stamped participant packs including participant sheet for parents and children (see Appendix 17-19), the same consent forms for both parents and children as used in Study 1 (see Appendix 5 & 6), hard copies of the scales used in Study 2 and a stamped self-addressed envelope were delivered to the NAS office in Glasgow, which were then forwarded to parents in their database on the researcher's behalf. Contact details for the researcher were also included in the information sheets, so that families who had any doubts could directly get in touch. An advertisement was also published on the NAS website.

8.2.2 Schools in Glasgow and surrounding areas: In total, 23 different schools, including 18 schools in the areas of Glasgow and Renfrewshire who helped with the recruitment in Study 1, also helped with the recruitment of participants for both the groups in Study 2. Once required permissions were obtained from the relevant Education Directorates, these schools were contacted to invite their participation in Study 2. Schools with special units were requested to forward the participant packs

to families of both the HFASD and TD children; and in mainstream schools, packs were requested to be forwarded to families with a TD child.

8.2.3 Parent support groups: About 20 voluntary and NAS organisations helped with the recruitment of participants in Study 1. The same organisations were contacted again for their help with Study 2 testing, through email and post. Along with the invitation letter, a copy of a flier advertising ‘call for participants’ for Study 2 was also enclosed and the organisers were requested to place it on their notice board for visitors. A website advertisement was also published on the website of the Scottish Autism Network Society and Sleep Scotland: the adverts for Study 1 were replaced with those of Study 2.

8.2.4 University Campus: As for Study 1, advertisements requesting participation of families in Study 2 were published on the PEGASUS Strathclyde University intranet and the fliers for Study 2 were posted around the university campus. The number of participants in both the HFASD and TD groups recruited from Study 1 and the four different sources, as discussed in the above sections, is summarised in a flowchart below:

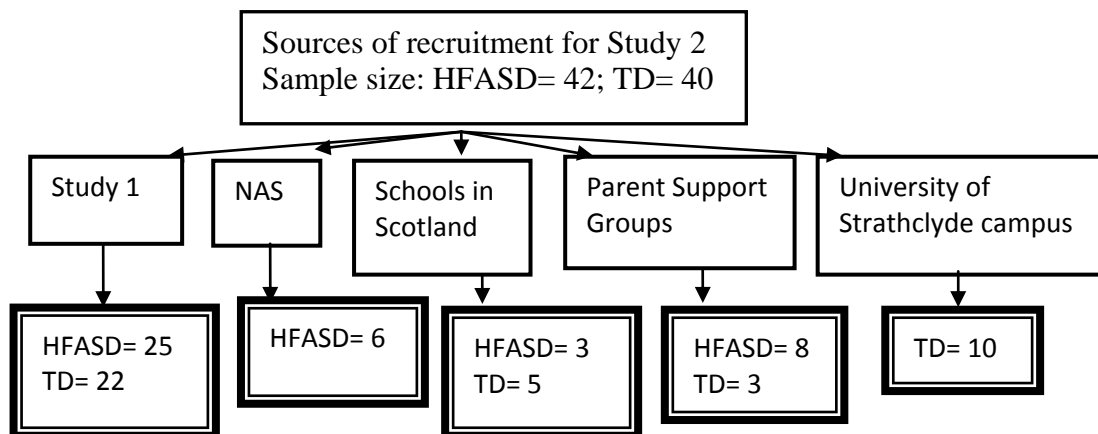


Figure 8.1: Breakdown of the number of participants recruited from the different sources in Study 2

8.3 Rights and security of participants' information

Study objectives and procedures were explained to parents and children in both the groups. They were assured that their participation was voluntary, that they had the right to withdraw at any time of the study; and that the information obtained from them would be treated in confidence and subsequently destroyed after the study was complete. Signed consents were obtained from all the children and parents on a paper copy of the consent form. As stated above, data were collected by telephone and for this purpose the participants were sent hard copies of all the questionnaires with instructions along with a stamped addressed envelope. Data were anonymised and separate code sheets containing confidential background information about the participants were stored separately for the purpose of analysis. Data were later transferred to SPSS (2009) and were stored on a password protected University computer.

8.4 Measures and procedure

A combination of self-report scales, questionnaires and narrative recall measures were used, out of which the techniques of *narrative recall*, *Appraisal questionnaire* and the *Emotion questionnaire* were also used in Study 1. Similar to the strategy adopted and assessed for accuracy in Study 1 (see Section 4.7 and Appendix 4.2.7), Study 2 data were collected by telephone. Use of telephone testing in Study 1 (see Section 4.4) was supported by the additional study (see Appendix 7) for the child-report measures of appraisal questionnaire, emotion questionnaire and the vocabulary sub-test of the WISC-IV scale. A new child-report measure of coping (KIDCOPE) and the new emotion categories of sadness and guilt were also assessed in Study 2. Thus, the accuracy of data collected through these new techniques by telephone, new

groups of children were recruited after gaining necessary approval from the ethics committee at the University of Strathclyde (Reference number: UEC0910/14); this was carried out as part of the additional study, as already explained in Section 4.4 (also see Appendix 7).

Participants in both the groups were requested to fill in the emotion and KIDCOPE questionnaire twice, at a gap of around 3-4 weeks: once face-to-face and once again by telephone. This testing was carried out with the same group of children at the same time as for Study 1 (see Section 4.4 & Appendix 7). Responses from both the modes of testing were found to be significantly correlated with large correlation coefficients ranging from .66 to .89 for the variables of guilt, sadness, approach coping, avoidance coping and the effectiveness of avoidance coping (see Table 3 in Appendix 7). Correlation coefficients for the variables of sadness and effectiveness of approach coping were of borderline significance (.06). This is discussed in Section 7.9 in Appendix 7. Since the two modes of data collection were highly correlated, telephone testing was considered to be an acceptable substitute for face-to-face administration, in the case of the emotion and KIDCOPE questionnaires, and for the other instruments previously used in Study 1.

In Study 1, eight Hindu children were recruited in the TD group, which was considered to be a potential source of bias in the findings, since children from a different ethnic group might have been taught different values (see Section 4.4). All the eight Hindu children from Study 1 continued their participation in Study 2. Differences between the Hindu and non-Hindu children's responses for appraisals, fear and the vocabulary sub-test of WISC-IV scale (Wechsler, 2004) were assessed during Study 1 and no significant differences were found (see Table 3 in Appendix

7), so these analyses weren't repeated for Study 2. Study 2 included the new variables of sadness, guilt, avoidance coping, approach coping and social difficulties, so the Hindu children's responses for these variables were compared to the non-Hindu children's responses, collected during the additional study. Non-significant differences were once again found between the two groups of children for guilt, sadness, approach coping, avoidance coping, effectiveness of approach coping, and effectiveness of avoidance coping (see Table 4 in Appendix 7). There was therefore, no evidence that data from the Hindu children were atypical, which suggested these could be used with confidence.

For data collection, questionnaires with instructions for parents and a self-addressed stamped envelope for the return of completed questionnaires were sent by post. The questionnaires with instructions were also uploaded on Survey Monkey, an online professional survey tool and the participants were sent the online link by email. Parents could submit their completed questionnaires online, if they had broadband access or could fill in the hard copies and return these in the enclosed, stamped self-addressed envelope. All families chose to return the hard copies only. Participants were asked to complete the questionnaires in a fixed order to ensure consistency across all the participants. Since the testing in Study 2 was carried out by telephone, throughout the testing session parents were present in the same room as their child to read out the instructions, just in case children were uncomfortable in speaking to the researcher by telephone. Telephone was kept on loud speaker setting during the testing. In all cases, since the child appeared comfortable in speaking to the researcher by telephone, instructions and questions were read out by the

researcher herself. Parents had however been advised that their help might be required and to be ready to prompt their child to respond.

8.4.1 Narrative Recall: The technique of narrative recall has been used by other researchers in past for the investigation of cognitions and emotions in children and adults (e.g., Losh & Capps, 2003; Solomon, 2004). This was also used in Study 1 with both the HFASD and TD groups. In Study 2, before administering these scales to children, the researcher explained the procedure to parents by telephone. Parents were told that if required, they will be asked to invite their child to describe a past negative emotional experience, which was both unpleasant yet important to them, and the necessary instructions were provided (see Appendix 20). Parental help was however not required as all the participant children were comfortable in speaking to the researcher by telephone. By asking children to recall a past negative situation, the primary appraisal dimensions of motivational relevance and motivational incongruence were established to set the stage for measurement of the other secondary appraisal dimensions in the recalled situation.

Children were told:

“I want you to think of a past negative situation or event, which was unpleasant yet important to you. Picture this situation in your mind. Try and remember as vividly as you can what this past situation was like: Think of what happened to make it appear unpleasant but important, and what it felt like to be in this particular situation. Tell me when you are ready and have this situation in your mind, and I will ask you questions about it.”

Once children said they were ready with a past situation in their mind, three questions about the experience designed to enable a fuller recall of previous negative experience in children were asked. For example: children were asked *“What happened in this situation to make it appear unpleasant to you?”*

Then questionnaires to measure their appraisals, emotions and coping strategies were administered. These are described below. This is the same interview technique that was used in Study 1, except that this time the children were asked to fill in the questionnaires to measure their appraisal, emotions and coping in situations from their own experience, rather than using hypothetical vignette, as was the case in Study 1.

8.4.2 Appraisal questionnaire: This questionnaire based on the work of Smith and Lazarus (1993), and was adapted for Study 1; and was administered again in Study 2 (see Appendix 21) for the new respondents in the HFASD and TD groups. This time, children were invited to respond on a 3 point scale (1-3) because all the participant children in Study 1 provided responses on the extreme ends of the 11-point scale and the middle scale points were not used.

8.4.3 Emotion questionnaire: Emotion questionnaire consisted of three emotional adjectives corresponding to fear, sadness and guilt, with one adjective for each emotion (see Appendix 22). This scale originally used by Smith and Lazarus (1993), was previously used in Study 1 to measure fear. Unlike Study 1, only one item was used for each of the three negative emotions and smileys for emotional adjectives were not included because children did not seem to find them helpful in Study 1; and for the reason outlined in Section 8.4.2 above, a 3 point scale (1-3) was used this time.

8.4.4 KIDCOPE: Spirito, Stark and William's (1988) KIDCOPE is a brief self-report measure that consists of 15 items; each of the 15 items represents one coping strategy (see Appendix 23). This scale was selected for use in Study 2 as it allows an

in-depth investigation of the ten different categories of coping, which can also be combined into the commonly discussed broader categories of approach and avoidance coping strategies. The KIDCOPE scale has also been shown to have moderate correlations with other commonly used scale: the Coping Strategies Inventory (Tobin, Holroyd, Reynolds, & Wigal, 1984).

Children were told:

“Below are a number of questions about how did you cope with situation you just described. For each question first answer on a 2-point scale of ‘yes’ or ‘no’ to indicate whether you used that specific coping strategy or not. Then, respond on a 3-point scale (not at all, a little, a lot) to express how helpful was that coping strategy”.

Children were invited to respond *yes* or *no* for each coping strategy to indicate whether they used a specific coping strategy to manage the negative situation they had just described. Children took 4-5 minutes to complete this scale. Responses were scored as 0 (*no*), 1 (*yes*) for the frequency of using a coping strategy and were given scores of 0 (*not at all*), 1 (*a little*) and 2 (*a lot*) for the effectiveness of each coping strategy. The 15 items in the KIDCOPE scale were classified in 10 sub-categories to form 10 distinct sub-scales, out of which five sub-scales consisted of two items each: distraction (e.g., *“I just tried to forget it”*), social withdrawal (e.g., *“I stayed by myself”*), ‘problem solving’ (*“I tried to fix the problem by thinking of answers”*), ‘emotional regulation’ (e.g., *“I tried to calm myself down”*), ‘wishful thinking’ (e.g., *“I wished I could make things different”*). The remaining five sub-scales were single item measures: ‘cognitive restructuring’ (*“I tried to see the good side of things”*), self-criticism’ (*“I blamed myself for causing the problem”*), ‘blaming others’ (*“I blamed someone else for causing the problem”*), ‘social support’ (*“I tried to feel*

better by spending time with others like family, grown-ups, or friends”) and ‘resignation’ (“*I didn't do anything because the problem couldn't be fixed*”).

These sub-scales could be further combined into the larger categories of approach coping and avoidance coping for analysis (Spirito et al., 1988; Spirito, 1996). Spirito proposed that positive/ approach coping scale consisted of the sub-scales of cognitive restructuring, problem solving, social support and emotional regulation. Negative/ avoidance coping scale consisted of the four sub-scales: distraction, blaming others, wishful thinking and resignation. The scores were also totalled to give scores for the two larger categories of approach and avoidance coping.

Spirito et al. (1988) report that test-retest reliability (for an interval of 3-7 days) for the KIDCOPE scales was .41 to .83, when administered to a sample of 330 children. In the present study, it was not possible to calculate reliability of the five single-item sub-scales as at least two items are required for the computation of Cronbach’s alpha. The other five sub-scales that consisted of two items and the larger categories of approach and avoidance were found to be reliable with Cronbach’s alpha values ranging from .80 to .84 for the HFASD and TD groups.

8.4.5 Paediatric Symptom Checklist (PSC): The PSC scale was designed by Jellinek, Murphy and Burns (1986) as a psychological screening tool to facilitate the recognition of cognitive, emotional and behavioural problems in children (see Appendix 24). This scale was used to assess differences in the difficulties in social adjustment reported by parents of children in the HFASD and TD groups. This scale consisted of 36 statements about children’s social life in general and the parents responded on a 3 point scale (0= *never*, 1= *sometimes*, 2= *often*) for each statement in

relation to their child's general functioning. Total score is calculated by adding score for each of the 35 individual items on the scale. The cut-off score of 28 indicates a significant level of psychological impairment in children aged 6-16 years of age.

The PSC scale was also found to have a rate of 89% inter-rater agreement and a kappa coefficient of .52 when compared to the Child Behaviour Checklist (Jellinek et al., 1986). This scale has also been shown to exhibit re-test reliability coefficients of .86 at a gap of two weeks (Jellinek et al., 1986). The PSC scale was found to be reliable in Study 2 as well with Cronbach's alpha coefficient of .87 for the HFASD group and .86 for the TD group. It took about 5-10 minutes for the parents to complete this scale.

8.4.6 Vocabulary sub- test from the Wechsler Intelligence Scale for Children-Fourth UK Edition (WISC-IV): This was a test from verbal sub-scale of the WISC IV (Wechsler, 2003) scale, used for an assessment of children's understanding of vocabulary in children aged 6 years to 16 years and 11 months (see Appendix 14). The same test was used in Study 1 (see Section 4.6.7) and was used again in Study 2 as a proxy measure of cognitive ability in children. The parents who had taken part in Study 1 were not invited to fill in this scale again for Study 2. Administration time was 5-10 minutes.

8.4.7. Childhood Autism Spectrum Test (CAST): The CAST scale was designed and standardised by Scott, Baron-Cohen, Bolton and Brayne (2002) for the screening of children aged 4-12 years at the risk for autism. The same scale was used in Study 1 and was used again in Study 2 for the new group of parents who were recruited for Study 2 only (see Appendix 15 & Section 4.6.8). Unlike other scales, since this was a

parent-report scale it was sent in post to all families; and the parents were requested to complete and return this scale in the enclosed self-addressed stamped envelope. Information on the number of participants from the HFASD and TD groups, included in administration of the seven measures, (described above) is presented in a flow chart below:

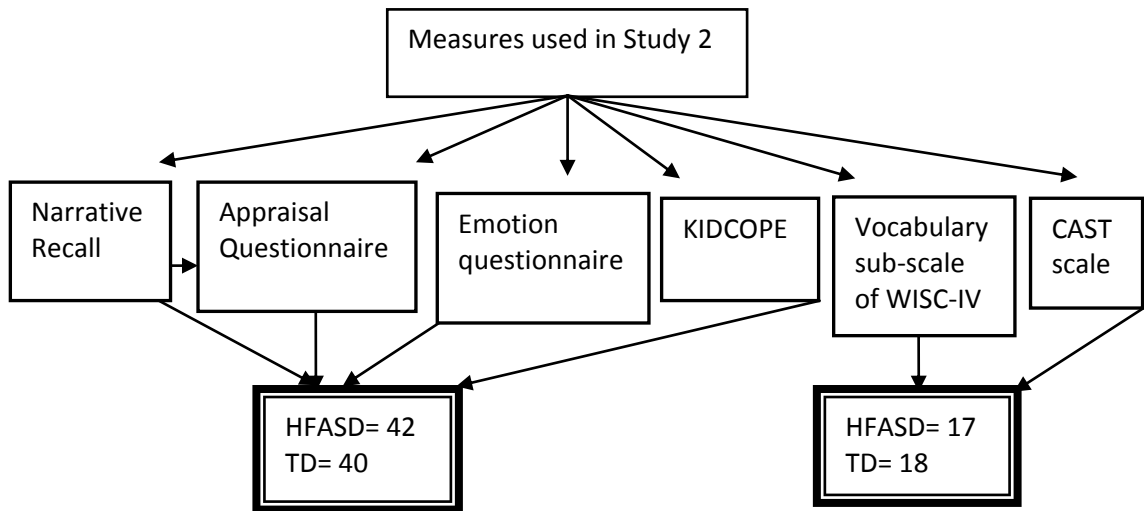


Figure 8.2: Breakdown of the number of participants for each measure in Study 2

8.5 Preliminary analysis

8.5.1 Normality test: Kolmogrov-Smirnov normality test was run to test the normality of each scale and its sub scales. All the scales had a significance value below .01, which suggested that data were not normal. The skewness and kurtosis values for each scale were then converted to z scores. In both the groups, the z values for skewness of all the scales were within the range of -1.96 to +1.96, which implies that data were not significantly skewed. But, the z scores for kurtosis of all the scales, except for the scales of age, WISC, self-accountability, sadness and avoidance coping, were found to be larger than 1.96, which explained why data might have failed the normality test. Statisticians have argued that modest violations of the assumptions for parametric tests can be tolerated and that kurtosis is a less serious

problem than skewness (Field, 2006). Since only kurtosis values violated the normality assumptions, parametric tests were carried out. However, as an extra measure of caution, the homogeneity of variance assumption for normality was also examined, as reported below.

8.5.2 Equality of variances: To further test whether parametric tests could be carried out, the homogeneity of variance was also examined by carrying out Levene's tests. Levene's test output was found not to be significant, which suggested that the assumption about equality of variances had not been violated.

Specific normality assumptions were also examined before proceeding with regression analyses carried out in Study 2, as shown below.

8.5.3 No perfect multi-collinearity: To check this assumption, correlation analyses between all the predictor variables (separately for each regression model) were carried out. None were higher than .9 or statistically significant; therefore the assumption of multi-collinearity was not violated and regression analyses could be reliably carried out with this dataset (Field, 2006). In addition, the Variance Inflation Factor (VIF) values were also requested from SPSS (2009) along with other regression output for each analyses carried out; none were higher than 1. This further confirmed that the multi-collinearity assumption had been met.

8.5.4 Homoscedasticity requirement for regression: This means that "*residuals at each level of the predictor(s) should have the same variance*" (Field, 2006, p. 170). This assumption was examined by requesting two regression plots, first between standardised residuals, *i.e.*, standardised difference between the predicted values by a model and the observed values in data. A second regression plot was requested

between standardised values of the dependent variable, predicted by the model and the values obtained by dividing the residual values by their estimated standard deviation. In both these figures, for all the variables, in the case of the six regression analyses carried out in Study 2, the dots seemed to be randomly distributed and did not have any particular shape; therefore, the assumption of homoscedasticity was met and regression analysis could be carried out.

8.5.5 Normally distributed errors: For checking whether difference in the values of the outcome variable predicted by the model and those observed were normally distributed, histogram and normal P-P curves were requested from the statistical software of SPSS (2009) along with other regression output. The histogram showed a curve very similar to the normal curve and the values in the normal P-P plot closely surrounded the line of fit for all the regression analyses carried out in Study 2. The residuals in this data were therefore normal (Field, 2006) and hence regression analyses could be carried out.

8.5.6 Linearity: To check whether the relationship between the outcome and the predictor variables was linear and lay along a straight line, partial regression plots were requested from SPSS (2009). In partial regression plots, dots were spread around the straight line of fit and therefore the assumption of linearity was also met.

8.6 Summary

A total of 42 children in the HFASD group and 40 TD children were recruited from the same sources that were contacted in Study 1; some participants had also taken part in Study 1. A combination of self-report, narrative recall, parent report scales and interview techniques were used with both the groups, some of which were

adapted and some had been used in Study 1. Data were collected by telephone for all the participants and for some participants in Study 1. Reliability of the scales with the present sample was found to be good.

Chapter 9: Results Study 2

9.1 Introduction

In this chapter, analyses on differences between the HFASD and TD groups for the appraisal dimensions (Hypothesis 1), negative emotions (Hypothesis 2) and coping strategies (Hypothesis 3) will be presented. Regression analyses will be carried out to examine the association between the four secondary appraisal dimensions and the negative emotions of fear, guilt and sadness (Hypothesis 4). Correlations between avoidance coping and social adjustment difficulties (Hypothesis 5); and of appraisals with avoidance coping (Research Question 1) will also be investigated. The list of hypotheses and research question is provided in Section 7.8.

9.2 Sample characterisation

9.2.1 Demographic information: Information on the age and gender of the participant children and the age at which their parents left education is presented in Table 9.1, separately for the HFASD and TD groups.

Table 9.1.

Demographic information for the HFASD and TD groups

	HFASD (N = 42)	TD (N = 40)
Age (years.months)		
8-8.11	6	3
9-9.11	7	5
10-10.11	14	16
11-12	15	16
Gender		
Male	34	30
Female	8	10

Noted difference in the means of age between the HFASD (mean= 10.26, S.D.= .73) and TD groups (mean= 10.33, S.D.= .69) was found to be non-significant, t (df=80)= -.39, p = .69. Similarly, the difference in the gender of the HFASD and TD groups, shown in Table 9.1, was also non-significant, χ^2 (df= 1, N = 82) = .42, p = .51

9.2.2 *CAST scale*: The HFASD group (mean = 19.10, S.D. = .82) had a higher mean value than the TD group (mean = 3.95, S.D. = .81) on the CAST scale. This difference was significant with a large effect size, t (df = 80) = 83.81, p < .001, d = .99. The cut-off score of 15 or above has been shown to be suggestive of a child being at the risk of developing autism-related symptoms (Scott et al., 2002). In Study 2, scores for all children in the HFASD group were found to be above the cut off score of 15, ranging from 15-26. On the other hand, scores of all children in the TD group were below 15, ranging from 4-11.

Table 9.2

Previous diagnoses or concerns about child's development

Questions on the CAST scale	No. of parents who responded as YES	
	HFASD (N = 42)	TD (N = 40)
Teacher or health professional expressed concern about child's health?	42	0
Has the child ever been diagnosed with any of these?		
Language delay	5	0
Hyperactivity/ ADHD	0	0
Hearing or visual difficulties	8	0
ASD condition	42	0
A physical disability	1	0

Table 9.2 shows the number of children in the HFASD and TD group who previously had the diagnosis of autism or other developmental delays and whether the teacher/ health professionals have expressed any concerns about child's

development. Parents' responses also suggested that concerns about their child's development were expressed by their school teacher or health professional for all children in the HFASD group; however, no concerns were reported as being previously expressed for any child in the TD group. All children in the HFASD group were previously diagnosed with autism spectrum conditions, including AS; five were additionally diagnosed with language delays, eight with hearing/ visual difficulties and one with physical disability. None of these children had the diagnosis or symptoms of any condition, other than autism at the present.

9.2.3 Vocabulary sub-test of WISC: The HFASD group had a similar mean score (mean = 12.40, S.D. = 1.10) to those in the TD group (mean = 12.30, S.D. = 1.11) for the vocabulary sub-test, which was used as a proxy measure for the full scale IQ (see Section 4.6.7 & 8.4.5). There was no significant difference between the two groups, t (df = 80) = .42, p = .67. This finding suggested that cognitive abilities of children in the HFASD and TD groups were within the normal range. Taken together, findings from the CAST scale and the vocabulary sub-test suggest that children in the HFASD group had symptoms related to autism and were likely to be of average IQ. Thus, these children had symptoms of high-functioning autism suggesting that children were reliably classified into the HFASD and TD groups.

9.2.4 Examination of responder bias: Since, 25 out of 42 children in the HFASD group and 22 out of 40 children in the TD group were from Study 1, a comparison of their developmental history, average scores as obtained from the CAST scale and scores from the vocabulary sub-test of the WISC-IV scale was carried out between the children who took part in Studies 1 and 2 and the children who only took part in Study 2. The results are shown in Table 9.3.

Table 9.3.

Testing for the potential responder bias

Questions on CAST scale	HFASD group		TD group	
	Took part in Studies 1 & 2 (N= 25)	Took part in Study 2 only (N= 17)	Took part in Studies 1 & 2 (N= 22)	Took part in Study 2 only (N= 18)
Previous concerns expressed at school	25	17	0	0
Previous diagnosis				
Language delay	4	2	0	0
Hyperactivity/ADHD	2	3	0	0
ASD condition	25	17	0	0
Physical disability	0	0	0	0
CAST score	18.93	19.21	4.28	3.97
Vocabulary score from WISC-IV	12.19	11.83	12.27	12.10

As shown in Table 9.3, all the parents in the HFASD group, who either took part in Studies 1 and 2, or only Study 2 reported that the teachers or health professionals had expressed concerns about their child's development in past. Further, in the HFASD group, four parents of children who participated in Studies 1 and 2, and three children who only participated in Study 2 reported the early diagnosis of language delays. Also, two parents who took part in Studies 1 and 2, while three parents of children who only took part in Study 2, reported that the diagnosis of ADHD was given to their child before the age of 3 years. Difference in the CAST scores (HFASD: $t(df = 40) = .63, p = .48$; TD: $t(df = 38) = .56, p = .40$) and vocabulary scores from the WISC-IV scale (HFASD: $t(df = 40) = .81, p = .26$; TD: $t(df = 38) = .80, p = .29$), between the two groups was also non-significant. It can therefore be argued that there weren't any major differences in the developmental history of children who volunteered their participation in Studies 1 and 2, and those

who only participated in Study 2. So, the chances of a responder bias occurring are low.

9.3 Difference between the two groups for secondary appraisals (Hypothesis 1)

Key findings:

- The HFASD group had significantly higher mean scores for the appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and future expectancy, but lower mean scores for self-accountability than the TD group. The appraisal dimensions were assessed through the appraisal questionnaire (Smith & Lazarus, 1993) presented after administration of the technique of ‘narrative recall’.

The HFASD group had a higher mean score for the secondary appraisal dimension of self-accountability compared to the TD group, as shown in Table 9.4. However, for emotion-focused coping potential, problem-focused coping potential and future expectancy, the HFASD group had a lower mean than the TD group. These differences were significant with a medium to large effect size for all the four secondary appraisal dimensions.

Table 9.4

Difference between the HFASD and TD groups for appraisals

Appraisal dimensions	HFASD group (N=42)		TD group (N=40)		<i>t</i> -test (df=80)	Effect size (<i>d</i>)
	Mean	S.D.	Mean	S.D.		
Emotion-focused coping potential	1.07	.81	2.10	.81	-5.37 (<i>p</i> = .002)	.51
Problem-focused coping potential	1.31	1.02	2.55	.50	-10.17 (<i>p</i> < .001)	.75
Self-accountability	1.12	.80	.42	.50	4.24 (<i>p</i> = .001)	.43
Future expectancy	.90	.76	2.55	.50	-11.97 (<i>p</i> < .001)	.80

The findings therefore provide support for the Hypothesis 1 of Study 2: the HFASD group will have significantly higher means for the secondary appraisal

dimension of self-accountability, but lower for emotion-focused coping potential, problem-focused coping potential and future expectancy.

9.4 Difference in emotions between the two groups (Hypothesis 2)

Key findings:

- The HFASD group had significantly higher mean scores for the negative emotions of fear, guilt and sadness than the TD group; the negative emotions were assessed through the emotion questionnaire (Smith & Lazarus, 1993) following the recall of a past negative experience through administration of the technique of ‘narrative recall’.

The HFASD group had higher means for fear, sadness and guilt than the TD group. These differences between the two groups were significant as shown below in Table 9.5.

Table 9.5.

Difference between the HFASD and TD groups for the negative emotions

Negative emotion	HFASD (N=42)		TD (N=40)		<i>t</i> -test analyses (df=80)	Effect size (<i>d</i>)
	Mean	S.D.	Mean	S.D.		
Fear	2.50	1.15	.45	.50	9.93(<i>p</i> < .001)	.74
Guilt	1.60	1.06	.50	.51	8.54 (<i>p</i> < .001)	.69
Sadness	.98	.81	.65	.66	2.64 (<i>p</i> =.009)	.28

These findings therefore provide support for the Hypothesis 2 of Study 2: the HFASD group will have higher means for the negative emotions of fear, guilt and sadness compared to the TD group.

9.5 Difference in coping strategies used by the HFASD and TD group (Hypothesis 3)

Key Findings:

- The HFASD group had significantly higher scores for avoidance coping and social difficulties in the recalled negative situations, but lower scores for approach coping than the TD group; coping scores were obtained through administration of the KIDCOPE scale (Spirito, 1988) and social difficulties score through administration of the PSC scale (Jellinek, 1986).

Mean values of the HFASD and TD groups were compared for all the ten sub-categories on the KIDCOPE (Spirito et al, 1986) scale, each referring to a particular coping strategy. The HFASD group had higher mean values for the sub-categories of *distraction, social withdrawal, self-criticism, wishful thinking* and *resignation*, compared to the TD group. However, the TD group had higher mean values than the HFASD group for the sub-categories of *cognitive restructuring, blaming others, problem solving, emotional regulation* and *social support*, as shown in Table 9.6.

Differences between the HFASD and TD groups for all the categories of coping strategies were tested by independent *t*-test analyses. Since there were ten sub-scales for which the responses of children in the HFASD and TD groups were compared, multiple *t*-tests were run, which can increase the chances of a type-I error, occurring (Field, 2006). Bonferroni correction was therefore carried out by adjusting the *p* value to one-tenth of its value (Howell, 2007). The new *p* value was therefore set at .005 (.05/10) while carrying out *t*-test calculations. All differences between the HFASD and TD groups for the ten sub-categories of coping were found to be significant at $p < .005$ with medium to large effect size (see Table 9.6). Scores for the sub-categories of coping reported above were further totalled to give scores for the larger categories of approach coping and avoidance coping. The HFASD group (mean = 9.62, S.D. = .99) had a significantly higher mean value for avoidance coping than the TD group (mean = 4.58, S.D. = 1.59), $t(df = 80) = 17.28, p < .001, d = .88$. However, the HFASD group's score for approach coping was significantly lower than the TD group (HFASD: mean = 5.10, S.D. = 1.62; TD group: mean = 10.28, S.D. = 1.154; $t(df = 81) = 16.59, p < .001, d = .88$). Effect size for both the outputs was large.

Table 9.6.

Difference between the HFASD and TD groups for coping strategies used

Coping strategy	HFASD (N=42)		TD group (N=40)		<i>t</i> -test analyses df =80	Effect size (<i>d</i>)
	Mean	S.D.	Mean	S.D.		
Distraction	9.14	.78	4.32	1.53	18.12 (<i>p</i> = .003)	.43
Social withdrawal	9.02	.84	4.52	1.15	20.24 (<i>p</i> = .002)	.45
Cognitive	4.45	1.13	10.25	1.23	-22.18 (<i>p</i> = .002)	.46
Self-criticism	2.88	.86	1.00	.78	10.32 (<i>p</i> = .003)	.34
Blaming others	1.71	.77	4.00	.82	-13.01 (<i>p</i> = .003)	.37
Problem solving	1.98	.84	8.95	.81	-38.31 (<i>p</i> < .001)	.57
Emotional regulation	3.00	.83	10.20	1.56	-26.35 (<i>p</i> = .001)	.49
Wishful thinking	3.60	1.08	.90	.78	12.88 (<i>p</i> = .003)	.37
Social support	2.90	.85	4.85	.83	-10.46 (<i>p</i> = .003)	.34
Resignation	10.38	1.23	2.08	.76	36.54 (<i>p</i> < .001)	.56

Differences in means of the efficacy scores for the combined categories of approach and avoidance coping were also examined using independent groups' *t*-tests. It was found that the HFASD group had a significantly lower mean value on the efficacy scores for avoidance coping (HFASD: mean = 3.72, S.D. = 1.08; TD: mean = 4.35, S.D. = .90, *t* (df = 80) = 12.08, *p* < .001, *d* = .80) and approach coping (HFASD: mean = 1.93, S.D. = .98; TD: mean = 7.07, S.D. = .90; *t* (df = 80) = 58.91, *p* < .001, *d* = .98) than the TD group. Taken together, these findings provided support for the Hypothesis 3 of Study 2: that the HFASD group will have higher means for avoidance coping than the TD group, who will have higher means for approach coping.

9.6 Appraisals and their association to the negative emotions (Hypothesis 4)

Key Findings:

- Linear regression output showed that the model consisting of the four appraisal dimensions as the predictor variables and the criterion variable of each of the three negative emotions of fear, guilt and sadness was significant, albeit only in the HFASD group.
- Subsequent regression analyses showed that in the case of the HFASD group, only one appraisal had a significant association with one emotion: the appraisal of emotion-focused coping potential had significant association with fear, self-accountability with guilt and future expectancy with sadness.

Six separate regression analyses using the 'Enter' method were carried out to estimate which of the four secondary appraisal dimensions of emotion-focused coping potential, future expectancy and self-accountability were associated with the three negative emotions of fear, guilt and sadness, in the case of the HFASD and TD groups. The statistical assumptions for reliably carrying out regression analyses have been examined for each analysis (see Sections 8.5.3-8.5.6). The four independent variables *i.e.*, the four secondary appraisal dimensions were entered simultaneously in one block for each of the three regression analyses.

9.6.1 Which secondary appraisal dimension is associated with fear? The model consisting of the four secondary appraisal dimensions of emotion-focused coping potential, self-accountability and future expectancy as the independent variables and fear as the dependent variable, was significant $F(4, 41) = 2.99, p = .014$. This model explained 16.3% of the variance (Adjusted $R^2 = .163$) in fear scores for the HFASD group. The same model consisting of the independent variables of the four appraisal dimensions was found to be non-significant in the case of the TD group, $F(4, 39) = .57, p = .68$. Relatively small sample size in Study 2 may have contributed towards the failure to identify a significant model. In such cases, the effect size values are useful, as these are indicative of the magnitude of the relationship between any two

variables and are less dependent on the sample size, as compared to the p -values, which facilitate assessment of the statistical significance of any analysis (Brand, Bradley, Best, & Stoica, 2008). A measure of the effect size for regression analyses is Cohen's f^2 , which is calculated using the following formula: $f^2 = R^2 / 1 - R^2$. A value of .02 for the Cohen's f^2 is interpreted as a small effect size, a value of .15 represents a medium effect size and a value of .35 indicates a large effect size.

For the TD group, Adjusted R^2 value was .072, therefore $f^2 = .08$. For the HFASD group, as shown above, Adjusted $R^2 = .163$, therefore $f^2 = .19$. This means that the appraisal dimensions had a significant association with fear only in the HFASD group and the magnitude of the relationship between appraisals and fear was of medium effect size for the HFASD group, while it was small-to-medium for the TD group. The full regression output for the HFASD group with values for the standardised and un-standardised regression coefficients for each of the three independent variables are shown in Table 9.7

Table 9.7

Regression coefficients for associated appraisals in the HFASD group (DV- fear)

Variable	B	t -value	β
Self-accountability	.09	.28 ($p = .19$)	.08
Future expectancy	-.02	.15 ($p = .31$)	-.01
Problem-focused coping potential	.03	.10 ($p = .39$)	.03
Emotion-focused coping potential	.55	5.91 ($p = .002$)	-.51

As shown in Table 9.7, out of the four secondary appraisal dimensions, only emotion-focused coping potential had a significant association with fear in the HFASD group, $\beta = -.51$, $p = .002$. Association between scores on the appraisal dimension of emotion-focused coping potential and with fear was negative.

9.6.2 *Which secondary appraisal dimension is associated with guilt?* The four secondary appraisal dimensions were significantly associated with guilt too, $F(4, 41) = 10.21, p = .004$ and explained 47.3% of the variance (Adjusted $R^2 = .473$) in guilt. The same model was however non-significantly associated with guilt for the TD group, $F(4, 39) = .26, p = .90$, Adjusted $R^2 = .108$. Inputting Adjusted R^2 values in the formula stated in Section 9.6.1 above, effect size value was found to be .89 for the HFASD group and .12 for the TD group. The magnitude of the relationship between appraisals and guilt was therefore large for the HFASD group, but small for the TD group. Values for the standardised and un-standardised regression coefficients for the independent variables are shown in Table 9.8.

Table 9.8.

Regression coefficients for associated appraisals in HFASD group (DV- guilt)

Variable	<i>B</i>	<i>t</i> -value	β -HFASD (N=42)
Self-accountability	.83	3.91 ($p = .004$)	.57
Future expectancy	-.03	.38 ($p = .11$)	-.03
Problem-focused coping potential	.01	.12 ($p = .53$)	.01
Emotion-focused coping potential	-.01	.16 ($p = .48$)	-.01

As can be seen in Table 9.8, out of the three secondary appraisal dimensions, only the appraisal dimension of self-accountability had a significant association with guilt in the HFASD group, $\beta = .57, p = .004$. The positive value for beta coefficient suggested that the appraisal of self-accountability had a linear relationship with guilt.

9.6.3 *Which secondary appraisal dimension is associated with sadness:* For the HFASD group, the four appraisal dimensions were found to be significantly associated with sadness too, $F(4, 41) = 3.99, p = .009$, which explained 22.6% of the variance (Adjusted $R^2 = .226$) in sadness. The four secondary appraisal dimensions

were however non-significantly associated with sadness in the case of the TD group, $F(4, 39) = .98, p = .16, \text{Adjusted } R^2 = .096$. Using the formula for Cohen's f^2 , shown in Section 9.6.1 above, the effect size value for the HFASD group was found to be .29 and .11 for the TD group, which indicates a medium effect size for the relationship between appraisals and sadness in the HFASD group, but small in the TD group. Values for the standardised and un-standardised regression coefficients of the independent variables, in the case of the HFASD group, are shown in Table 9.9.

Table 9.9.

Regression coefficients for associated appraisals in HFASD group (DV- sadness)

Variable	<i>B</i>	<i>t</i> -value	β (N=42)
Self-accountability	.10	.14 ($p = .51$)	.15
Future expectancy	.49	5.31 ($p = .003$)	-.69
Problem-focused coping potential	.17	.18 ($p = .46$)	.18
Emotion-focused coping potential	-.21	-.47 ($p = .24$)	-.21

As shown in Table 9.9, only future expectancy had a significant association with sadness in the HFASD group, $\beta = -.69, p = .003$. Negative value of the beta coefficient suggests that future expectancy had an inverse relationship with sadness. Taken together, these findings provided support for the Hypothesis 4 of Study 2: the secondary appraisal dimensions will be significantly associated with fear, sadness and guilt in the HFASD group.

9.7 Does coping have a significant association with social difficulties? (Hypothesis

5)

Key Findings:

- Scores on the frequency of avoidance coping had a significant and positive association with social difficulties score, albeit only for the HFASD group.

Descriptive and inferential statistics for the difference in mean scores of avoidance and approach coping were presented in Section 9.5. The variable of social difficulty was assessed using the PSC (Spirito et al., 1988) scale, which was a parent-report scale designed to assess the level of difficulties in social adjustment. The HFASD group (mean = 23.95, S.D. = 2.79) had higher average PSC scores than the TD group (mean = 13.20, S.D. = 3.17); and this difference was found to be statistically significant with a large effect size, when tested by *t*-test for independent groups, $t(df = 80) = 16.31, p < .001, d = .87$.

In order to investigate association between the scores on coping and social difficulty, Pearson’s correlation analyses were carried out for both the HFASD and TD groups, the output is shown in Table 9.10.

Table 9.10

Correlation output for the association between coping and social difficulty

Coping variables	Social difficulty: Correlation coefficient (<i>r</i>)	
	HFASD group (N=42)	TD group (N=40)
Approach coping	-.10 ($p = .38$)	-.21 ($p = .09$)
Avoidance coping	.53 ($p < .001$)	.03 ($p = .62$)

As can be seen in Table 9.10, avoidance coping had a significant and positive association with social difficulty scores in the HFASD group only. These findings provided support for the Hypothesis 5 of Study 2.

9.8 Are appraisal dimensions and avoidance coping associated? (Research Question

1)

<p>Key findings:</p> <ul style="list-style-type: none"> • All the four appraisal dimensions had a significant association with scores on avoidance coping. • No significant associations between the three appraisal dimensions and avoidance coping in the TD group, however previous research suggested possible associations.
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Pearson’s correlation analyses were carried out to investigate association of the four secondary appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy with the scores on avoidance coping, separately for the HFASD and TD groups. The output is shown in Table 9.11:

Table 9.11.

Correlation output for the association between appraisals and avoidance coping

Variable	Avoidance coping: Correlation coefficient (<i>r</i>)	
	HFASD	TD
Self-accountability	.29 (<i>p</i> =.03)	.09 (<i>p</i> = .07)
Future expectancy	-.20 (<i>p</i> = .04)	-.01 (<i>p</i> = .21)
Problem-focused coping potential	-.38 (<i>p</i> = .02)	-.06 (<i>p</i> = .17)
Emotion-focused coping potential	-.47 (<i>p</i> = .01)	-.12 (<i>p</i> = .07)

As shown in Table 9.11, all the four secondary appraisal dimensions were found to be significantly associated with avoidance coping, albeit only in the HFASD group; none of these associations were significant for the TD group. Further, the value of the correlation coefficient appeared to be largest for the appraisal dimension of emotion-focused coping potential.

These findings informed the Research Question 1 of Study 2: that appraisals are significantly associated with avoidance coping, albeit in the HFASD group only.

9.9 Summary

This chapter presented statistical analyses for investigating the list of Hypotheses and Research Question for Study 2 (see Section 7.8), which were all supported. Compared to the TD group, the HFASD group was found to have significantly lower means for the secondary appraisal dimensions of future expectancy, emotion-focused coping potential and problem-focused coping potential, while higher means were obtained for the appraisals of self-accountability, emotions of fear, guilt, sadness and avoidance coping. The secondary appraisal dimensions were found to be significantly associated to the three negative emotions and avoidance coping, while avoidance coping had a significant association with the social difficulty scores. These associations were statistically significant for the HFASD group only.

Chapter 10: Discussion Study 2

10.1 Introduction

This chapter will discuss Study 2 findings on differences between the HFASD and TD groups for the secondary appraisal dimensions (Hypothesis 1), negative emotions of fear, guilt and sadness (Hypothesis 2), and coping (Hypothesis 3) in relation to previous research and the findings of Study 1. The findings on associations of the four appraisal dimensions with the three negative emotions (Hypothesis 4), avoidance coping (Research Question 1); and between coping and social difficulty (Hypothesis 5) will also be discussed.

10.2 Differentiation between the HFASD and TD groups

Children in the HFASD group scored significantly higher than the TD group on the items relating to social and communication impairments on the CAST scale (Scott et al., 2002). All children in the HFASD group also scored above the cut-off point of 15, as specified by Scott et al. for an indication of autism-related problems and scores for all children in the TD group were below 15. Children's performance on the vocabulary sub-test showed no significant differences between the TD and HFASD groups, which indicated an average IQ in both the groups. This supported the allocation of the participants into the HFASD and TD groups in Study 2.

10.3 Difference in scores on appraisal dimensions between the HFASD and TD groups (Hypothesis 1)

Key points:

- The finding of between group differences for the appraisal dimensions was consistent across Studies 1 and 2, despite the use of different methodologies: in Study 1 the appraisal questionnaire was presented following the hypothetical frustrating vignette and in Study 2 following the technique of narrative recall.

In Study 2, the HFASD group was found to have a significantly higher mean for the secondary appraisal dimension of self-accountability, but a lower mean for the secondary appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy than the TD group; these findings provided support for the Hypothesis 1 of Study 2. This was similar to the findings of Study 1, whereby the HFASD group was found to differ significantly from the TD group on all the four secondary appraisal dimensions. The findings from Studies 1 and 2 together suggest that the HFASD group might exhibit impairment in appraisals in the negative and frustrating social situations, such that the situations are appraised as high in self-accountability, but lower in emotion-focused coping potential, problem-focused coping potential and future expectancy.

Such a profile of appraisal dimensions has been shown to be responsible for negative emotional experiences in previous research studies, in the case of groups of children and adults without autism (e.g., Grych & Fincham, 1990; Hammen, 1988; Kerig, 1998a; Sheets, Sandler, & West; 1996; Smith & Lazarus, 1993). For example, Sheets et al. (1996) examined appraisals of relevance, self-accountability, expectancy and coping potential in the context of parental divorce. Their study showed that higher appraisals of expectancy of parental divorce had a larger effect on

psychological symptoms in children than the stressful event in itself. Although, children in the HFASD group did not experience the same kind of social difficulties as children going through a parental divorce, it may be that appraisal of future expectancy of a negative event is also associated with adjustment difficulties in this group.

10.4 Difference in scores on negative emotions between the HFASD and TD group (Hypothesis 2)

Key points:

- The finding on significant between group differences for fear was consistent with the Study 1 finding on fear.
- A new finding of Study 2 was on the significantly higher means for guilt and sadness in the HFASD group compared to the TD group, which supported the limited, available research evidence.

Study 2 showed that children in the HFASD group had significantly higher means for fear, guilt and sadness compared to the TD group; these findings provided support for the Hypothesis 2 of Study 2. Study 2 thus confirmed the findings from Study 1, relating to greater fear in the HFASD group, while employing different methodologies in Study 1 (*hypothetical frustrating vignette*) and Study 2 (*narrative recall*). It has been already shown in previous research studies (Kim, Szatmari, & Bryson et al., 2000; Tonge, Brereton, Gray, & Einfield, 1999) that children with HFASD exhibit high fear and anxiety; thus the findings from Studies 1 and 2 provide further support for this.

Since only fear and anxiety were examined in Study 1, a new finding from Study 2 was that the HFASD group were found to have significantly higher mean values for sadness and guilt compared to the TD group. There is other evidence for occurrence of high guilt (Kasari, Camberlain, & Bauminger, 2001) and sadness (Moore, Hobson,

& Lee, 1997) in children with autism. These findings therefore support the existing literature on the experience of negative emotions by showing significantly higher levels of fear, sadness and guilt in the HFASD group.

10.5 Association between the appraisal dimensions and negative emotions

(Hypothesis 4)

Key points:

- The finding of non-significant association between the four appraisals and fear in the TD group was inconsistent with the Study 1 finding of significant correlation.
- In the case of HFASD group, only one appraisal was found to have a significant association with one emotion: the appraisal of emotion-focused coping potential had a significant association with fear, self-accountability with guilt and future expectancy with sadness. In contrast, in Study 1 fear had a significant correlation with all the four appraisal dimensions.

All the three regression models, consisting of the independent variables of the four secondary appraisal dimensions of emotion-focused coping potential, problem-focused coping potential, self-accountability and future expectancy, and the dependent variable of one of three negative emotions of fear, guilt and sadness, were found to be significant, albeit only in the case of the HFASD group. These findings provided support for the Hypothesis 4 of Study 2. In the case of the TD group, the models consisting of all the four secondary appraisal dimensions were non-significantly associated with the three negative emotions of fear, guilt and sadness. This finding appears to be in conflict with the findings of Study 1, whereby significant correlations were found between the secondary appraisals and the negative emotions for both the TD and HFASD groups. It should however be noted that small-to-medium effect size values for these analyses in the TD group indicate the potential significance of the relationship between appraisals and negative emotions, if re-investigated with a relatively larger sample size. These findings also

suggest that the HFASD group might not only differ from the TD group on mean scores of the appraisal dimensions, but also on significance of the appraisal-negative emotion relationships.

Further in the HFASD group, only one secondary appraisal dimension was found to be significantly associated with each of the three negative emotions. Fear only had one significant association with emotion-focused coping potential, sadness with future expectancy and guilt with self-accountability. Nevertheless, the finding from Study 2 that only one appraisal dimension of emotion-focused coping potential and self-accountability had significant associations with fear and guilt, respectively, is in agreement with Smith and Lazarus's (1993) appraisal model. Study 2 findings also supported results from another study by Rossman (1991), who showed the appraisal of self-accountability to be associated with guilt.

In Study 2, future expectancy was found to be significantly associated with sadness in the HFASD group. This finding is in partial agreement with previous research carried out with the TD groups of adults and children, since the structural appraisal model by Smith and Lazarus (1993) and the findings of the study by Rossman, Antoniou and Jose (1996) also showed future expectancy to be associated with sadness; however, this was alongside problem-focused potential. This finding suggests that the appraisal-negative emotion relationships might be different in the case of the HFASD group, in such a manner, that only one appraisal dimension of future expectancy might be associated with sadness.

However, for fear also, Study 2 showed only emotion-focused coping potential to be significantly associated with it in the HFASD group, while Study 1 showed fear to

be associated with more than one secondary appraisal dimensions. This finding from Study 2 was in agreement with the structural appraisal model of Smith and Lazarus (1993), as only one appraisal dimension of emotion-focused coping potential was proposed to be associated with fear. It should however be noted that in Study 1, only correlation analyses were carried out, but in Study 2 regression analyses were carried out to assess the relations between appraisal dimensions and fear. Therefore, it is possible that the other two appraisal dimensions of problem-focused coping potential and future expectancy are also associated with the occurrence of fear, but the association is not strong enough to be identified as significant in a regression analysis. The findings from Studies 1 and 2 thus indicate that at least the appraisal dimension of emotion-focused coping potential might be associated with fear, self-accountability with guilt and future expectancy with sadness, in the HFASD group. The findings from the regression analyses in this case remain limited to the interpretation of associations alone, since Study 2 had a cross-sectional design.

Taken together, the findings of Study 2 add novel results and a new direction for research by suggesting that impairment in appraisal dimensions might be associated with the occurrence of negative emotions in the HFASD group. Appraisal dimensions have not been studied in participants with HFASD before and its inclusion here represents the first examination of the relationship between appraisals and negative emotions. If reconfirmed through future research, this may be helpful to professionals and parents in understanding the emotional needs of these children and for the designing of appropriate intervention programmes.

10.6 Coping, its perceived effectiveness and association with social difficulties

(Hypotheses 3 & 5)

Key points:

- Study 2 findings on significantly higher mean scores of the HFASD group for avoidance coping and social difficulties added further evidence to the limited pool of available research evidence.
- The finding on significant and positive association of avoidance coping with social difficulties score in the HFASD group is novel for research on children with autism. The finding on non-significance of the association between avoidance coping and social difficulties, in the case of the TD group is however, inconsistent with previous research.

The findings provided evidence that the HFASD group used avoidance coping to manage the recalled negative events more than the TD group. The HFASD group was found to have significantly higher means for the coping sub-categories of *distraction, social withdrawal, resignation, self-criticism* and *wishful thinking*; these sub-types belonged to the larger category of avoidance coping. On the other hand, significantly lower means were found for the sub-categories of *cognitive restructuring, blaming others, problem solving, emotional regulation, and social support* in the HFASD group, compared to the TD group. These coping strategies are often grouped under the larger category of approach coping (Spirito et al., 1986). The efficacy scores of the HFASD group for avoidance and approach coping were also found to be significantly lower than those of the TD group; these findings together supported the Hypothesis 3 of Study 2.

These findings suggest that the coping strategies chosen by the HFASD group were perceived by them to be ineffective in comparison to the TD group. The limited research evidence has also suggested that children with HFASD use avoidance and emotion-focused coping patterns to manage fear and stress (e.g. Gupta & Sharma, 2005; Konstantareas & Stewart, 2006). Study 2 has thus added further evidence to

the pool of limited existing research findings on the coping choices of children with HFASD.

The HFASD group was also found to have significantly higher scores for social difficulties as measured by the parent-report PSC questionnaire (Jellinek et al., 1986). Previous studies have consistently shown social difficulties to be central to the condition of autism (e.g., Wing, 1981; Gillberg & Gillberg 1989; Ghaziuddin, 2005) and social difficulties have been cited as the essential and necessary conditions for the diagnosis of autism in children (DSM-IV-APA, 1994). This Study 2 finding thus added further evidence for the presence of social difficulties in children with HFASD, when assessed using a parent-report questionnaire.

In Study 2, the association between coping and social difficulty was also assessed and the results were found to be significant for the HFASD group only. This finding supported the Hypothesis 5 of Study 2. The findings for the HFASD group suggested that the mean scores of avoidance coping had a negative association with the scores on social difficulty, while approach coping had a non-significant association with the social difficulty. The former finding is in agreement with previous research evidence for children and adults without autism, whereby avoidance coping has been shown to be both predictive of and associated with social difficulties (e.g., Compas, Malcarne, & Fondacaro, 1988; Knight et al., 1979; Roger & Holmbeck, 1997; Sandler, Tein, & West, 1994- also see Table 7.1). None of these correlations were however significant for the TD group.

10.7 Association between appraisals and avoidance coping (Research Question 1)

Key points:

- Study 2 finding on significant and negative correlation between the appraisal of emotion-focused coping potential and avoidance coping in the HFASD group is novel and offers preliminary findings for future research.
- The finding on no significant associations between the four appraisals and avoidance coping in the TD group is however, inconsistent with previous research.

A research question in Study 2 related to the association of appraisal dimensions with the scores on coping in the HFASD and TD groups. For this purpose, correlation analyses were carried out separately for the HFASD and TD groups. Significant correlations were found between avoidance coping and the four secondary appraisal dimensions of self-accountability, emotion-focused coping potential, problem-focused coping potential and future expectancy. These associations were statistically significant only for the HFASD group. Positive correlation was found between self-accountability and avoidance coping, while the correlation output was negative for the other three appraisal dimensions. This finding suggested that in the situations characterised by high mean scores for the appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy, the scores for avoidance coping were relatively lower in the case of the HFASD group. The opposite is indicated by the positive correlation coefficient between self-accountability and avoidance coping.

Further, of the four secondary appraisal dimensions, the appraisal dimension of emotion-focused coping potential had the largest value of correlation coefficient for its association with avoidance coping. Smith and Lazarus (1993) also proposed a direct association between the appraisal of low coping efficacy and actual coping,

resulting in escape and avoidance in typically developing individuals. This might be true to the group of children with HFASD as well. Other studies too have supported the association between the appraisals related to coping potential and the subsequent coping choices of children (e.g., Folkman & Lazarus, 1985; Galassi, Frierson, & Sharer, 1981; Neufeld, 1976), but the relationship between appraisals and coping has not been studied in children with HFASD before. Study 2 has thus suggested a potentially important role of the cognitive appraisal dimensions in association with not only these negative emotions, but also with avoidance coping, which is already known to be maladaptive (e.g., Sandler et al., 1994).

10.8 Identified limitations and directions for Study 3

10.8.1 Limitations: In contrast to the findings of Study 1, where more than one secondary appraisal dimension was associated with fear in the HFASD group, only one secondary appraisal dimension was found to be associated with each of the three negative emotions examined in Study 2. A possible reason could be the sample size for Study 2, since Green (1991) argued that regression models with sample sizes of smaller than $109 + \text{number of predictors}$ might provide an accurate test for the significance of a regression model, but might not be strong enough to show significance of individual predictor variables.

The findings of non-significant association between appraisals and negative emotions in the TD group might need to be replicated through future research as despite obtaining a $p\text{-value} > .05$, small-to-medium effect sizes were found for these analyses. Even a small effect size indicate the potential importance of a finding, however it might require a larger sample size for obtaining a significant association. So, it is possible that the appraisals were indeed associated with the negative emotions in the

TD group, but relatively small sample size prevented this from being statistically significant.

There is also the issue of the interpretation of the findings from regression analyses, as Study 2 had a cross-sectional design. It is not necessary that the appraisals predicted the development of the negative emotions or the choice of avoidance coping strategies in the HFASD group. The inverse relationship could also be true. This can only be clarified in a longitudinal design where the independent and dependent variables are measured at Time 1 and then reassessed at Time 2. Such a design can help assess which variable would lead to the development of the other. Despite some limitations, the findings from Study 2 provides preliminary insights into the relatively under-developed area of research into appraisals and coping in children with HFASD; and the findings indeed provide useful starting points for further research.

10.8.2 Directions: In Studies 1 and 2 so far, only appraisals of the HFASD group in negative life events have been investigated. Furthermore, the finding that the children who participated in Studies 1 and 2, which were carried out six months apart and with different methodologies, showed significant impairment in appraisals at both the times, highlights a need to study what associations such impairments might have in long-term. Data on what association these stable differences in the appraisal styles over time might have with more stable cognitive traits, such as, attributions is now required. Some studies (e.g., Russell & McAuley, 1986; Weiner, Russell, & Lerman, 1978, 1979) that investigated appraisal dimensions have also discussed attribution style as a more stable reflection of appraisals across situations and time in typically developing population. Longer term association of impairment in appraisal

dimensions with attribution style, which is also known to be predictive of depressive symptoms will therefore be assessed in Study 3, in the HFASD group.

10.9 Summary

The findings of Study 2 provided support for all the Hypotheses of Study 2. The findings 2 showed that the HFASD group had significantly higher scores for guilt, sadness, avoidance coping and had lower efficacy scores for their general coping choices than the TD group. Study 2 also showed significant associations of the four appraisal dimensions with avoidance coping and a significant correlation between avoidance coping and social difficulty, albeit only in the HFASD group. These findings also supported some of Study 1 findings where a similar profile of impairment in appraisal dimensions and fear in the HFASD group was found (see Table 10.1).

Table 10.1

Comparison of findings between Studies 1 and 2

Variable/associations	Study1	Study 2
Secondary appraisal dimensions	Self-accountability higher in HFASD group; emotion-focused coping potential, problem-focused coping potential and future expectancy lower in HFASD group than the TD group	Same finding
Negative emotions	Significantly higher fear in the HFASD group than the TD group	Significantly higher fear, sadness and guilt in the HFASD group than the TD group

Chapter 11: Appraisals, negative attribution style and depressive symptoms in children with high functioning autism-Literature review Study 3

11.1 Introduction

This chapter will present a rationale and research design for a small follow-up study designed to extend the findings of Studies 1 and 2 to the related dimension of cognitive attributions, over a long term period. This study also aims to investigate the effect of attributions on depressive symptoms in the HFASD and TD groups.

11.2 A brief history of theory and research into cognitive attributions

Research on attribution dates back to the 1950s, around this time Heider (1958) introduced the concept of attribution to psychological theories. Heider believed that human beings are naïve scientists who constantly engage in attempts to answer *why* question about their day-to-day experiences, in order to make sense of the social world. Cognitive process through which the *why* questions are answered were referred to as attributions. Heider asserted that such answers are pivotal in determining the subsequent emotional well-being of individuals. Focus of his attribution theory was loci of causality, *i.e.* during the meaning-making process of the occurrence of daily events; causes are attributed to the factors internal or external to oneself. This was considered to be accurate, but too narrow a description of cognitive attributions; and so Heider's initial descriptions were later expanded by other researchers (Försterling, 1985; Weiner, 2008).

Attribution was then defined as the difference in emotions experienced that result from stable individual differences in attributing the causes of failure or success in a situation (Weiner, 1979). Theorists (Peterson & Seligman, 1984; Weiner, 1985) also proposed specific causal dimensions, which influence emotions and along which attributions are made: locus of causality assess whether the external or internal factors are perceived to be the cause of success or failure; stability dimension concerns the perceived stability or variability of its cause over time and the third dimension of controllability refers to the extent to which an individual feels in control of a situation's outcome. People who attribute success to internal, stable and controllable causes and failure to external, unstable and uncontrollable/specific causes were proposed to be better adjusted. In contrast, individuals who attribute success to external, unstable and uncontrollable causes and failure to internal, stable and uncontrollable causes were argued to be poorly adjusted (Weiner, 1991). The latter group of individuals is known to exhibit a negative/external attribution style, whereas the former group demonstrates positive/internal attribution styles. These attribution styles have been shown to have a direct impact on the social emotional well-being (Weiner, 2008, 2010). Some researchers have also used the term global attribution dimension for the controllability dimension, whereby the attributions of low controllability signalled high globality (Mezulis, Hyde & Abramson, 2006).

11.3 Appraisals and attribution style in children with autism

It has been argued that situation-specific appraisals made repetitively over time might eventually evolve into stable, trait-like attributions (Levy, 1993). Although appraisal dimensions are useful in providing unique insights into why children feel and behave in situations the way they do, they may vary from situation to situation

(Lazarus & Folkman, 1984). Attributions on the other hand, are much less sensitive to the context and are a more stable reflection of an individual's cognitive style (Weiner, 1985). A literature search using different combination of the keywords of attribution, internal, stable, global, controllable, depression, social difficulty, autism and Asperger was carried on the databases of - Web of Science, PsycINFO, Omnifile FT Select and MEDLINE, for studies carried out between the years 1981-2010. Two studies were found that assessed cognitive attributions in children with autism. So, unlike appraisals, attributions have been previously investigated in children with autism, specifically AS, who were found to have a negative attribution style characterised by high scores on the attribution dimensions of internality, stability and globality (Barnhill, 2001; Barnhill & Myles, 2001). The findings from both the studies were similar as children with AS attributed the cause of negative vignettes or recalled situations to the causes internal to themselves such as lack of ability and viewed negative events as permanent and unalterable in nature.

These findings are also comparable to the results of Studies 1 and 2, since the HFASD group appraised negative events as high in self-accountability, but low in coping potential and future expectancy. In fact, self-accountability can be argued to be somewhat comparable to the attribution dimension of internality, since both involve holding oneself responsible for the cause of an event. Similarly, the appraisal dimension of future expectancy can be considered to be related to the globality attribution as both relate to the negative expectations about the outcome of situations. Finally, the appraisal dimensions of emotion and problem-focused coping potential can also be linked to the stability attribution, since these indicate viewing an event as unalterable. Appraisals were consistently found to be impaired in Studies 1 and 2;

further previous research too has shown evidence for the occurrence of negative attributions in children with AS. This suggests that there may be a possible association between appraisals and attributions in children with HFASD.

Since appraisals are known to vary from situation to situation (Lazarus & Folkman, 1984; also see Section 3.3), while attributions are more stable in nature (Weiner, 1985), could there be a longer-term association between these two cognitions, in such a manner that situational faulty appraisals might predict more stable biases in cognitive attribution style in long-term? This issue has not been investigated before, but since both appraisals (from findings of Studies 1 & 2) and attributions (Barnhill, 2001) are known to be impaired in children with HFASD, Study 3 will investigate attributions in relation to appraisals. While Barnhill (2001) and Barnhill and Myles (2001) examined only average attribution scores, Study 3 will examine attributions in more detail by assessing the three attribution dimensions of internality, stability and controllability/globality as well as the average negative attribution style.

11.4 Association between attributions and depressive symptoms

Researchers have shown that children's attributions are an accurate reflection of their emotions in a situation they are in, and that the negative attributions are directly predictive of depressive symptoms (Ball, McGuffin, & Farmer, 2008; McAuley, Russell, & Gross, 1983; Weiner, 1979). Evidence for the relationship between causal attributions for success or failure outcomes and depressive symptoms largely comes from groups of children without autism (e.g., Robins & Hinkley, 1989; Seligman, Peterson, & Tannenbaum et al., 1984). For example, Robins and Hinkley (1989) studied a sample of 61 comprising 8-12 year old children and showed a significant

and positive association between the attribution dimension of stability and depressive symptoms. Researchers have also found evidence for a characteristic negative attribution style in children with depression (e.g., Gibb & Alloy, 2010; Gladstone & Kaslow, 1995; Mezulis, Abramson, Hyde, & Hankin, 2004; Rooney, Roberts, & Kane, 2006).

Two studies by Barnhill (2001) and Barnhill and Myles (2001) that investigated attributions in children with AS also examined the association between attributions and depressive symptoms. Barnhill (2001) found a significant association between negative attribution style and depressive symptoms in adolescents with AS, such that more the adolescents explained the cause of failure by their internal factors, such as their lack of ability, the higher were their scores on a depression measure. Similarly, Barnhill and Myles (2001) showed evidence for a higher occurrence of depressive symptoms in 33 adolescents with AS, who attributed negative events to internal, stable and global causes. A significant association between depressive symptoms and average negative attribution style was also found. The occurrence of depressive symptoms and negative attribution style might thus be associated in children with HFASD, but from these findings alone, it is not clear as to which specific attribution dimensions were associated with depressive symptoms, or if all three were. Further, since depressive symptoms are commonly known to occur in children with autism (as will be shown in the next Section), Study 3 will aim to investigate the three attribution dimensions in association with depressive symptoms in children with HFASD. Research evidence on the presence of depressive symptoms in children with autism is discussed below.

11.5 Occurrence of depressive symptoms in children with HFASD

Depressive symptoms have also been frequently cited as a co-morbid condition in children and adults with ASD (Ghaziuddin, 2002; Ghaziuddin, Ghaziuddin & Greden, 2002; Matson & Nebel-Schwalm, 2007). Children with HFA/AS have even been shown to exhibit depressive symptoms from as early as 4 years of age. An illustrative summary of eight studies examining the occurrence of depressive symptoms in children with HFA/AS is shown in Table 11.1.

Table 11.1.

Child studies showing occurrence of depressive symptoms in children with autism

Authors	Sample size	Age range (years)	Findings
1. Lopata et al. (2010)	40 HFA/AS: 40 TD	7-13	40% of the HFA/AS sample had clinically significant depressive symptoms and further 29% were at risk. The HFA group had significantly higher depressive symptoms than the TD group.
2. Joshi et al. (2010)	217 autism: 217 TD	3-17	56% had major depressive disorder
3. Mazefsky et al. (2010)	31 HFA/AS	10-17	32% of the sample had significant levels of depressive disorder on mother report scale
4. Volker et al. (2010)	62 HFA/AS: 62 TD	6-16	The HFA group had significantly higher scores for depression clinical sub-scale than TD group.
5. Vickerstaff et al. (2007)	22 HFA	7-13	32% of sample rated themselves as being depressed
6. Green et al. (2000)	20AS: 20 conduct disorder	11-19	Both groups showed depressive symptoms and 1 with AS qualified for the ICD-10 diagnosis for depression
7. Kim et al. (2000)	19 autism:14 AS	9-14	17% of the sample had clinically significant levels of depression scores, no significant difference.

Across these studies, children with HFA/AS were found to have significantly higher scores for depressive symptoms than the TD groups^{1,2,4}, but had comparable levels of depressive symptoms when considered in relation to the group of children with conduct disorder⁶. Another study⁷ compared children with AS and those with HFA, and found no significant differences for the occurrence of depressive symptoms between these two sub-groups of autism; however, 17% of the total sample consisting of children with autism had significantly high levels of depressive symptoms. In other studies, where only children with HFA/AS were recruited, 17-56% of the sample had clinically significant depressive symptoms^{3,5}. As can be seen in Table 11.1, these studies included a wide age-range in their sample starting from 3 years of age till 19 years. It suggests that depressive symptoms might become visible by as early as 3 years of age and persist until the end of the teenage years in children with autism.

In addition to the between-group studies presented in Table 11.1, case studies too have indicated the presence of depressive symptomatology in children and adults with autism (e.g., Clarke, Baxter, & Perry et al., 1999; Gillberg, 1985; Hare, 1997; Long, Wood, & Holmes, 2000; Wing, 1992). Despite such consistent findings from research studies carried out since the early 1980s, there are only limited research findings on cognitive underpinnings to the occurrence of depressive symptoms in children with autism. Study 3 will thus investigate relationship between the attribution dimensions and attribution style with depressive symptoms in children with HFASD and TD children.

11.6 Specific hypotheses and research questions

Based on the research evidence and arguments presented in Sections 11.2-11.5, Study 3 will investigate between-group differences for the two new variables of attribution and depressive symptoms. Cognitive attributions will be studied in relation to the appraisals that were examined at Studies 1 and 2. The variable of depressive symptoms will be examined in relation to attributions. As in Studies 1 and 2, a group of TD children will also be included for comparison with the HFASD group. Specific hypotheses and research questions for Study 3 are:

Replicated hypotheses:

1. Children in the HFASD group will have significantly higher scores for negative attribution style, *i.e.* a higher average score for the three attribution dimensions of internality, stability and globality compared to the TD group
2. Children in the HFASD group will have significantly higher scores for depressive symptoms than children in the TD group.

New Hypotheses

3. Scores on the attribution dimensions of internality, stability and globality will be significantly different between the HFASD and TD groups.
4. All the three attribution dimensions of internality, stability and globality will be significantly associated with the scores on depressive symptoms in the HFASD and TD groups.

Research question:

1. Are the appraisals as measured in Studies 1 and 2 one year and six months previously associated with average attribution score and the attribution dimensions of internality, stability and globality, as measured in Study 3?

11.7 Summary

In this chapter, an association between the appraisal dimensions measured at Studies 1 and 2, and the attributions planned to be assessed in Study 3 is proposed. The case for a significant association between the scores on attributions and depressive symptoms was also presented.

Chapter 12: Methodology Study 3

12.1 Introduction

This chapter will present a description of a research design developed with the aim of testing the hypotheses and research questions proposed for Study 3. This chapter will also discuss how the participants from Studies 1 and 2 were contacted for participation in Study 3, in order to be able to study the association between appraisals and attributions in the longer term; and present preliminary statistics to check data characteristics.

12.2 Participants and selection procedures

Study 3 data collection was scheduled to allow a period of at least 6 months between Studies 2 and 3 and of one year between Studies 1 and 3, in order to study the longer-term association between appraisal dimensions, measured at Studies 1 and 2, with attributions planned to be measured at Study 3. No new families were contacted for Study 3. Before contacting the participants from Studies 1 and 2, permission from the University of Strathclyde Ethics Committee was obtained (Reference number: UEC0809/04).

A request for participation in Study 3 was sent to all the families who participated in Study 2 (n= 42: HFASD; 40: TD); some took part in Study 1 as well. Twenty five children in the HFASD group and 22 in TD group from the total sample in Study 2 were from Study 1. In response to the recruitment request (sent by email and/or post), 23 out of 25 HFASD participants and all 22 in the TD group, who took part in Studies 1 and 2, agreed to take part in Study 3. From those who had been in Study 2 only, 12 out of 17 participants in the HFASD group agreed to take part in Study 3,

and 15 out of 18 in the TD group. In Study 3 therefore, the number of participants in the HFASD group comprised 23 participants from Studies 1 and 2, and 12 from Study 2 only; resulting in a total number of 35. In the TD group, there were 22 participants from Studies 1 and 2, and 15 from Study 2 only; totalling 37 (see Table 12.1).

Table 12.1

Sources of recruitment for participants in Study 3

	Participants from both Studies 1 and 2	Participants from Study 2 only	Participants in Study 3
HFASD	N =23	N=12	N=35
TD	N=22	N=15	N=37

For studying longer term association of appraisals with attribution style over a period of one year, data were available from 23 children in the HFASD group and 22 in TD group. For the analysis of longer term associations over a period of six months, data were available from 35 children in the HFASD group and 37 in TD group. This sample size was considered sufficient for the required analyses types: *t*-test, correlation, ANOVA and regression based on the power analyses and sample size calculation presented in Section 4.2.2 in Study 1.

Participant information sheets were posted out to the above families who had agreed to take part in Study 3 (see Appendices 25-27). The consent forms for parents and children were included in the post (see Appendices 5-6) along with a stamped-addressed envelope for return to the researcher. Scales for Study 3 as in Study 2 were also administered by telephone. Similar procedures were followed as for Study 2 (see Section 8.2), *i.e.* hard copies of the questionnaires were enclosed in the participant pack for families to refer to, while the researcher administered scales by telephone.

This non-standard telephone data collection mode of testing could have biased the findings and hence additional study was carried out (full description in Appendix 7).

As part of the additional study, data from new families with a child with HFASD and families with a TD child were collected as described in Studies 1 and 2, after gaining necessary ethics approval from the ethics committee at the University of Strathclyde (Reference number: UEC0910/14). Eight children with HFASD and eight TD children were recruited; and the child-report scale used in Study 3 was administered to all children in both the groups twice: once face-to-face and then again by telephone at a gap of 3-4 weeks (for more information on the sample and procedures, see Sections 7.2-7.7 in Appendix 7). As for studies 1 and 2, data were then tested for a degree of correlation between the face-to-face and telephone testing modes for the HFASD and TD group, separately. Large, significant correlations ranging from .76 to .94 were found between the two modes of testing for each group (see findings for Study 3 in Table 3, in Appendix 7).

In Study 3, five Hindu TD children took part and as previously discussed, since they were from an ethnic minority group, inclusion of such atypical children in the small sample size of 35 could have biased the findings. New data collected from eight TD children during the additional study was therefore also used to assess significance of difference in the responses of Hindu and non-Hindu children. The output from the Mann Whitney *U*-tests was found to be non-significant for all the three attribution dimensions and the average attribution score between the Hindu and non-Hindu groups of children (see Table 4 in Appendix 7). Taken together, these findings suggested that telephone testing and inclusion of Hindu children in the sample were unlikely to have biased the findings of Study 3 (see Appendix 7).

12.3 Measures and procedure

12.3.1 Children's Cognitive Style Questionnaire (CCSQ): This is a self-report instrument for measurement of attributions that was developed by Mezulius, Hyde and Abramson (2006). This was selected for use in Study 3 because this scale allows an assessment of all the three attribution dimensions across four different negative social situations (see Appendix 28). An average score for the attribution style can also be calculated. Mezulius et al. used it for interviews of children aged 9-11 years old. This questionnaire invited children to imagine being in six different hypothetical scenarios with the purpose of assessing children's cognitive style. Four out of the six scenarios were negative in nature, while two were positive and were included to counter-balance the effect of the negative scenarios on the general psychological well-being of children during testing. However, for the purpose of the analysis, the children's responses to only the negative scenarios were scored.

Each scenario was followed by five statements assessing the attribution dimensions of internality, stability and globality. Children were invited to rate each of the six scenarios from 0 (*don't agree at all*) to 5 (*agree a lot*). A total score of children's responses to each of the four dimensions in the four negative scenarios was calculated, which was an indicator of composite negative attribution style in children. In addition, a total of scores corresponding to the individual attribution dimensions from each scenario was also calculated to give scores for the three different sub-scales of internality, stability and globality.

In their study, Mezulius et al. (2006) found internal reliability for the negative composite as .79 at age 9, and .84 at age 11. They also used the same scale with a sample of children aged 8-12 years old and reported an internal consistency of .83;

and a 2-week test-retest reliability of .81. Cronbach's alpha for all the sub-scales with the participants of Study 3 was also good and ranged from .75-.83. Administration time for this scale was approximately 10 minutes.

12.3.2 Birlson Depression Scale: This is a self-report scale, which was designed by Birlson (1981) for assessing depressive symptoms in children aged 7-12 years. This scale consisted of 18 items, which were marked on a scale of *never* (score of 0), *sometimes* (score of 1) and *mostly* (score of 2) for how a child felt during the past one week (see Appendix 29). This scale was chosen for the assessment of depressive symptoms in children since it is a standard and widely used instrument. Birlson (1981) reported a split-half reliability coefficient of .86, and test-retest reliability of .80 for the full scale consisting of 18 items. Previous research studies too have shown a good internal reliability of the Birlson's Depression Scale with a Cronbach's alpha of .79 (Robins & Hinkley, 1989) and .57 (Oldenburg & Kerns, 1997).

For the current study, the item "*I think life isn't worth living*" was deleted because of its negative connotation, which could have upset children. The final scale therefore consisted of 17 items. Cronbach's alpha for the modified scale was found to be .80 for the HFASD group and .81 for TD group in Study 3. Administration time for this scale was approximately 10 minutes.

12.4 Preliminary analysis: Normality test

The assumptions and rules of normality were tested as in Section 8.6. The Kolmogorov-Smirnov normality test was again used to test the normality of data collected from the CCSQ (Mezulis et al., 2006) and the Birlson Depression inventory (Birlson, 1981); and data from the selected participants of Study 2 on the appraisal

questionnaire and their sub-scales. The scales for assessment of attributions and depressive symptoms had a significance value of higher than .01, which suggested that data were normal. However, the significance value of normality test for the selected data on the appraisal questionnaire used in Study 2, for the HFASD group, was below .01. So skewness and kurtosis values for the appraisal scale were converted to z scores. The z values for skewness and kurtosis for the appraisal questionnaire, in the case of HFASD group, were within the range of -1.96 to +1.96, which implied data did not significantly deviate from the normality standards for skewness and kurtosis. Parametric tests were therefore carried out to analyse data from Study 3.

12.5 Summary

Twenty-three families of children with HFASD and 22 families of TD children who took part in Studies 1 and 2; and 12 families of children with HFASD and 15 of TD children who had only taken part in Study 2, agreed to participate in Study 3. The total sample size of Study 3 was therefore 35 children in the HFASD group and 37 children in TD group. The CCSQ (Mezulis et al., 2006) and Birleson Depression Scale (Birleson, 1981) were used in Study 3 to measure cognitive attributions and depressive symptoms.

Chapter 13: Results Study 3

13.1 Introduction

In this chapter, longer term association between the appraisals assessed during Studies 1 and 2 and the attributions investigated at the time of Study 3 (Research Question 1) will be presented. Analyses for testing the significance of difference between the HFASD and TD groups in their average scores on the attribution scale (Hypothesis 1), for each of the three attribution dimensions (Hypothesis 3), scores on the Birleson Depression Inventory (Hypothesis 2) and association between the scores for attribution style and depressive symptoms (Hypothesis 4), will also be shown.

13.2 Sample Characterisation

13.2.1 Demographic information: Information on the age and gender of the participant children, gender of their siblings, the age at which both mother and father left education are presented in Table 13.1.

Table 13.1.

Demographic information for HFASD and TD groups

	HFASD (N = 35)	TD (N = 37)
Age (years.months)		
8-8.11	6	3
9-9.11	8	8
10-10.11	10	13
11-11.11	11	13
Gender		
Male	27	25
Female	8	12

An independent groups *t*-test showed that the mean age of children in the HFASD group (mean = 9.83; S.D. = 1.16) was not significantly different from the mean age

of children in the TD group (mean = 9.97; S.D. = 1.04), t (df = 70) = - .51, p = .61.

The apparent difference in gender between the two groups was also not significant, χ^2 (df = 1, N = 72) = .44, p = .50.

13.2.2 CAST scale: The HFASD group (mean = 19.05, S.D. = .81) had a higher mean value than the TD group (mean = 4.00, S.D. = .80). This difference was significant with a large effect size, t (df = 80) = 78.85, p < .001, d = .95. The cut-off score of 15 or above has been shown to be suggestive of a child being at the risk of developing autism-related symptoms (Scott et al., 2002). In Study 3, scores for all children in the HFASD group were found to be above the cut off score of 15, ranging from 15-29. On the other hand, scores of all children in the TD group were below 15, ranging from 4-10.

Table 13.2

Previous diagnoses or concerns about child's development

Questions on the CAST scale	No. of parents who responded as YES	
	HFASD (N = 35)	TD (N = 37)
Has the teacher or health professional expressed concern about child's health?	35	0
Has the child ever been diagnosed with any of these?		
Language delay	3	0
Hyperactivity/ ADHD	1	0
Hearing or visual difficulties	0	0
ASD condition	35	0
A physical disability	0	0

Table 13.2 shows additional information collected from the CAST scale about the number of children in the HFASD and TD groups, who previously had the diagnosis of autism or other developmental delays; and whether the concerned teacher/ health professionals have expressed any concerns about children's development. As shown

in Table 13.2, concerns about their child's development were expressed by the school teachers or health professionals for all children in the HFASD group, but none for children in the TD group. All children in the HFASD group had previously been diagnosed with ASD conditions, including AS; one was additionally diagnosed with the signs of hyperactivity/ADHD at the age of 2 years. This child did not have any signs of ADHD at present.

13.2.3 Vocabulary sub-test of WISC-IV: The HFASD group had a similar mean score (mean = 12.27, S.D. = 1.07) to those in the TD group (mean = 12.31, S.D. = 1.13) for the vocabulary sub-test, which was used as a proxy measure for the full scale IQ (see Section 4.6.7 & 8.4.5). There was no significant difference in these mean scores for the vocabulary sub-test between the two groups, $t(df = 70) = -.17$, $p = .86$. This finding suggested that cognitive abilities of children in the HFASD group and the TD groups were within normal range. Taken together, findings from the CAST scale and the vocabulary sub-test suggest that children in the HFASD group had symptoms related to autism; and were likely to be of an average IQ. Thus children in the HFASD group had symptoms of high-functioning autism suggesting that children were reliably classified into the HFASD and TD groups.

13.2.4 Examination of responder bias: Since only 35 out of 42 children in the HFASD group and 37 out of 40 children in the TD group tested during Study 2 agreed to take part in Study 3, additional information about the developmental history of children from Study 2 who did and did not take part in Study 3, are shown in Table 13.3.

Table 13.3.

Testing for potential responder bias

Questions on CAST	HFASD group (from Study 2)		TD group (from Study 2)	
	Took part in Study 3 (N= 35)	Didn't take part in Study 3 (N= 7)	Took part in Study 3 (N= 37)	Didn't take part in Study 3 (N= 3)
Previous concerns expressed at school	35	7	0	0
Previous diagnosis				
Language delay	0	0	0	0
Hyperactivity/ ADHD	1	0	0	0
ASD condition	35	7	0	0
A physical disability	0	0	0	0

As can be seen in Table 13.3, all the parents from Study 2 in the HFASD group, who either agreed or did not agree to take part in Study 3, reported that the teachers or health professionals had expressed concerns about their child's development in past. So, there was no apparent difference for the reported problems in their developmental history at school, between the reports of parents who continued taking part in Study 3 and who did not.

Further, no child from Study 2 in the HFASD group whose parents did not take part in Study 3 had any diagnosis of developmental delay other than autism-related conditions. However, amongst children with HFASD who participated in Studies 2 and 3, one child had a previous diagnosis of ADHD at a younger age, but none at present. So, there were only some noted differences in the developmental history of children with HFASD from Study 2, who did or did not take part in Study 3.

13.3 Between-group differences for attribution dimensions, attribution style and depressive symptoms (Hypotheses 1, 2 & 3)

Key findings:

- The HFASD group had significantly higher mean scores for the attribution dimensions of internality, stability and globality; and average negative attribution style than the TD group; assessed through the CCSQ scale (Mezulus et al., 1996); the analysis technique was *t*-test for two independent groups.
- The HFASD group also had significantly higher mean scores for depressive symptomatology than the TD group; assessed through the Birleson Depression Inventory (Birleson, 1981); analysed through *t*-test for two independent groups.

Only responses to the negative scenarios in the attribution questionnaire were utilised for obtaining scores for the attribution dimensions (see Section 12.3.1). The HFASD group also had significantly higher scores for the internality attribution (HFASD mean = 11.51, S.D. = 2.12; TD mean = 5.54, S.D. = 1.75; $t(df = 70) = 12.99, p < .001$), stability (HFASD mean = 11.30, S.D. = 1.89; TD mean = 5.69, S.D. = 1.41; $t(df = 70) = 14.17, p < .001$) and globality (HFASD mean = 10.92, S.D. = 1.71; TD mean = 7.20, S.D. = 2.18; $t(df = 70) = 8.08, p = .002$). This finding provided support for the Hypothesis 3 of Study 3. Difference in mean scores of the HFASD and TD groups were also statistically significant for the average negative attribution style score (HFASD mean = 54.95, S.D. = 4.96; TD mean = 38.66, S.D. = 4.19; $t(df = 70) = 14.88, p < .001$). The HFASD group (mean = 17.65, S.D. = 4.34) also had a higher mean score for depressive symptoms than the TD group (mean = 6.34, S.D. = 1.61). This difference was significant, $t(df = 70) = 15.05, p < .001$. These provided support for the Hypotheses 1, 2 and 3 of Study 3: that children in the HFASD group had significantly higher mean scores for the negative attribution style,

depressive scores and the attribution dimensions of internality, stability and globality than the TD group.

13.4 Association between appraisals and attributions (Research Question 1)

Key findings:

- Fewer significant correlations were found in the TD group than the HFASD group between the attributions assessed at Study 3 and the appraisal dimensions assessed during Studies 1 and 2.
- The appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy had significant and negative correlation with maladaptive attributions, while the appraisal of self-accountability had a positive association.

It was argued that the appraisal dimensions examined at Studies 1 and 2 might have an association with the attribution dimensions of internality, stability, globality and the average negative attribution style score assessed during Study 3, *i.e.* in the longer term. In order to test this, separate correlation analyses were carried out by examining the relationship between the appraisals assessed during Studies 1 and 2 with the attributions assessed during Study 3.

13.4.1 Association of appraisals studied during Study 1 with attributions assessed one year later-HFASD group: Results from correlation analyses carried out to examine the degree of association between appraisals examined during Study 1 with the attributions assessed at Study 3, at a time gap of one year, are shown in Table 13.4. For this analysis, there were 23 children in the HFASD group and 22 in the TD group. The appraisal dimensions were examined at Study 1 and the attribution dimensions were assessed during Study 3, *i.e.* after a time-period of one year.

Table 13.4.

Correlation between appraisals and attributions, one year later, in the HFASD group (N= 23)

<i>Variables</i>	<i>Internality</i>	<i>Stability</i>	<i>Globality</i>	<i>Average negative attribution</i>
Emotion-focused coping potential	-.52 (<i>p</i> = .01)	-.50 (<i>p</i> = .03)	-.49 (<i>p</i> = .03)	-.48 (<i>p</i> = .02)
Problem-focused coping potential	-.12 (<i>p</i> = .64)	-.16 (<i>p</i> = .49)	-.34 (<i>p</i> = .03)	-.18 (<i>p</i> = .04)
Future expectancy	-.81 (<i>p</i> = .002)	-.69 (<i>p</i> = .006)	-.72 (<i>p</i> = .005)	-.70 (<i>p</i> = .005)
Self-accountability	.64 (<i>p</i> = .007)	.68 (<i>p</i> = .007)	.65 (<i>p</i> = .006)	.61 (<i>p</i> = .007)

As can be seen in Table 13.4, the appraisal dimensions of emotion-focused coping potential, future expectancy and self-accountability were each significantly correlated with the three attribution dimensions of internality, stability and globality, and with the average negative attribution style. Both the appraisal dimensions of emotion-focused coping potential and future expectancy had a negative association with the attribution dimensions and the average attribution style score, but the appraisal of self-accountability had a positive association. The appraisal dimension of problem-focused coping potential was not significantly associated with the attribution dimensions of stability and internality, but was with the globality dimension and the average negative attribution style score. The correlation coefficient for this association was also negative.

13.4.2 Association of the appraisals studied during Study 1 with the attributions assessed, one year later in the TD group: Correlation analyses between the appraisals assessed at Study 1 and the attributions assessed at Study 3 were also carried out for the TD group, the results are shown in Table 13.5.

Table 13.5.

Correlation between the secondary appraisals and attributions, one year later, in the TD group (N= 22)

<i>Variables</i>	<i>Internality</i>	<i>Stability</i>	<i>Globality</i>	<i>Average attribution</i>
Emotion-focused coping potential	-.20 (<i>p</i> = .04)	-.26 (<i>p</i> = .04)	-.09 (<i>p</i> = .63)	-.18 (<i>p</i> = .04)
Problem-focused coping potential	-.02 (<i>p</i> = .68)	-.06 (<i>p</i> = .39)	-.04 (<i>p</i> = .74)	-.03 (<i>p</i> = .57)
Future expectancy	-.36 (<i>p</i> = .02)	-.31 (<i>p</i> = .02)	-.02 (<i>p</i> = .65)	-.24 (<i>p</i> = .03)
Self-accountability	.03 (<i>p</i> = .72)	.08 (<i>p</i> = .09)	.05 (<i>p</i> = .76)	.01 (<i>p</i> = .67)

For the TD group, there were fewer significant correlations between appraisals and attributions. Only the appraisal dimensions of emotion-focused coping potential and future expectancy had negative correlations with the attribution dimensions of internality and stability, and with the negative attribution score. No significant correlations were found between the appraisals of problem-focused coping potential and self-accountability with either the globality attribution dimension or the negative attribution score.

13.4.3 Association of the appraisals studied during Study 2 with the attributions assessed six months later-HFASD group: Correlation analyses were again carried out to test the degree of association between the appraisals examined during Study 2 with attributions assessed at Study 3, six months later. Results for the HFASD group are shown in Table 13.6. The findings shown in Table 13.6 show that the appraisals of self-accountability and future expectancy were significantly associated with all the three attribution dimensions and average negative attribution style. The appraisal dimension of problem-focused coping potential had a significant negative correlation with the attribution dimensions of stability, globality and average negative attribution

style, but non-significant with the internality attribution. The associations between appraisals of emotion-focused coping potential and the three attribution dimensions and average score were not significant. Nor was the correlation between problem-focused coping potential and internality attribution.

Table 13.6.

Correlation between the appraisals and attributions, six months later, in the HFASD group (N= 12)

<i>Variables</i>	<i>Internality</i>	<i>Stability</i>	<i>Globality</i>	<i>Average attribution</i>
Emotion-focused coping potential	-.26 (<i>p</i> = .11)	-.18 (<i>p</i> = .27)	-.28 (<i>p</i> = .08)	-.30 (<i>p</i> = .06)
Problem-focused coping potential	-.27 (<i>p</i> = .09)	-.40 (<i>p</i> = .01)	-.59 (<i>p</i> < .001)	-.51 (<i>p</i> = .001)
Future expectancy	-.51 (<i>p</i> = .001)	-.66 (<i>p</i> < .001)	-.65 (<i>p</i> < .001)	-.74 (<i>p</i> < .001)
Self-accountability	.44 (<i>p</i> = .006)	.57 (<i>p</i> < .001)	.69 (<i>p</i> < .001)	.69 (<i>p</i> < .001)

13.4.4 Association of the appraisals studied during Study 2 with the attributions

assessed six months later-TD group: Results from correlation analyses to test association between the appraisals investigated at Study 2 with the attributions, assessed at Study 3, after a time gap of six months, for the TD group, are shown below in Table 13.7. In contrast to the significant correlations found in the HFASD group, only one association was significant in the TD group. In this case, only the appraisal dimension of future expectancy was negatively correlated with the attribution of stability.

Table 13.7.

Correlation between the appraisals and attributions, six months later, in the TD group (N= 15)

<i>Variables</i>	<i>Internality</i>	<i>Stability</i>	<i>Globality</i>	<i>Average attribution</i>
Emotion-focused coping potential	-.24 (<i>p</i> = .15)	-.21 (<i>p</i> = .21)	-.09 (<i>p</i> = .60)	-.10 (<i>p</i> = .56)
Problem-focused coping potential	-.05 (<i>p</i> = .73)	-.19 (<i>p</i> = .27)	-.09 (<i>p</i> = .58)	-.01 (<i>p</i> = .94)
Future expectancy	-.04 (<i>p</i> = .78)	-.36 (<i>p</i> = .03)	-.06 (<i>p</i> = .73)	-.08 (<i>p</i> = .61)
Self-accountability	.19 (<i>p</i> = .27)	.02 (<i>p</i> = .87)	.20 (<i>p</i> = .24)	.22 (<i>p</i> = .20)

Taken together, these findings for both the HFASD and TD groups informed the Research Question 1 of Study 3: that the appraisals measured during Study 1 had a significant association with the attributions measured during Studies 1 and 2, one year and six months later.

13.5 Are the scores on attributions associated with the scores on depressive symptoms? (Hypothesis 4)

Key findings:

- The attribution dimensions of internality, stability and globality and average score for the negative attribution style had a significant and positive correlation with the scores on depressive symptomatology, albeit only in the HFASD group.

In order to test the relationship between the scores on attributions and depressive symptoms in the HFASD group, regression analyses were carried out, separately for the HFASD and TD groups. The scores for the attribution dimensions of internality, stability and globality obtained from the CCSQ scale (Mezulis et al., 2006) were entered simultaneously as the independent variables, using the ‘Enter’ method in SPSS (2009); and the total score obtained from Birlson Depression Inventory

(Birlleson, 1981) was entered as the dependent variable. This analysis was carried out twice, separately for the HFASD and TD groups. This regression model was found to be a significant predictor of the scores on depressive symptoms in the HFASD group, $F(3, 34) = 4.62, p = .009$, and explained 23.2% of the variance (Adjusted $R^2 = .232$) in depressive symptoms (see Table 13.8). These findings suggest that the scores on the attributions of internality, stability and globality had a positive association with the scores on depressive symptoms in the HFASD group.

Table 13.8.

Regression coefficients for attributions as the predictors of the scores on depressive symptoms in the HFASD group (N= 35)

Variable	B	t-value	β
Internality attribution	1.28	5.97 ($p = .02$)	.65
Stability attribution	1.57	9.68 ($p = .005$)	.76
Globality attribution dimension	1.09	4.10 ($p = .03$)	.47

Regression coefficient values suggested that the stability attribution dimension might have the largest association to the scores on depressive symptoms and the globality attribution might have the smallest. The same model tested in a separate regression analysis was, however, found to be non-significant for the dependent variable of depressive symptoms, in the TD group, $F(3, 34) = .47, p = .70$. These findings supported the Hypothesis 4 of Study 3: that all the three attribution dimensions were significantly associated with the scores on depressive symptoms in the HFASD group.

13.6 Summary

The findings from Study 3 showed significantly higher scores for the average negative attribution style, attribution dimensions of internality, stability, globality and depressive symptoms in the HFASD group, compared to the TD group. The

appraisal dimensions assessed during Studies 1 and 2 had a significant correlation with all the three attribution dimensions in the HFASD group, whilst there were much fewer significant associations in the TD group. Similarly, the association of attribution dimensions with the scores on depressive symptoms was significant for the HFASD group, but non-significant for the TD group. These findings are discussed in the next chapter.

Chapter 14: Discussion Study 3

14.1 Introduction

This chapter discusses the relationships between the appraisal dimensions measured during Studies 1 and 2 and the attributions assessed at Study 3, after a period of one year and six months, respectively (Research Question 1). Differences between the HFASD and TD groups for their scores on the average negative attribution style (Hypothesis 1), three attribution dimensions (Hypothesis 3) and depressive symptoms (Hypothesis 2), are also discussed. Regression analyses of the association between the attributions and depressive symptoms (Hypothesis 4) will also be discussed.

14.2 Between-group differences on attribution dimensions, attribution style and depressive symptoms (Hypotheses 1, 2 & 3)

Key points:

- Study 3 finding on the significantly higher mean values of the HFASD group than TD group for the average negative attribution style score and the scores on depressive symptomatology added further empirical evidence to the available literature.
- The finding on significantly higher mean scores of the HFASD group than TD group for each of the three attribution dimensions of internality, stability and globality extended the limited, available research evidence on cognitive attributions in children with autism.

The HFASD group had a significantly higher mean for the negative average attribution style score and higher scores for the attribution dimensions of internality, stability and globality than the TD group. These findings therefore suggest that a negative attribution style characterised by the attribution dimensions of internality,

globality and stability attribution dimensions might be used by the HFASD group in negative situations of the kind presented in the CCSQ scale (Mezulis et al., 2006). These findings add further support to the limited, existing research evidence about the presence of negative attribution style in adolescents with AS (Barnhill, 2001; Barnhill & Myles, 2001). This suggests that children with HFASD might exhibit a bias in the cognitive processing of negative social situations, whereby the cause of events is attributed to the factors internal to themselves and viewed as uncontrollable. Children in the HFASD group were also found to have a significantly higher score for depressive symptoms assessed through administration of the Birlson Depression Inventory (Birlson, 1981) compared to the TD group. Frequent occurrence of depressive symptoms in children with HFASD is also well documented (Stewart, Barnard, & Pearson et al., 2006; also see Table 11.1) and these findings from Study 3 add to this literature. The findings on higher scores in the HFASD group for the negative attribution style and depressive symptoms compared to the TD group supported the Hypotheses 1 and 2 of Study 3, respectively.

A new finding from Study 3 was that the HFASD group had significantly higher mean scores for all the three attribution dimensions than the TD group, since, previously, only the average attribution style was investigated without having a comparison group. These findings supported the Hypothesis 3 of Study 3 by showing higher than normative levels of performance on the negative attributions in the negative vignettes, compared to the TD group. Higher scores for the internality attribution might imply that the HFASD group ascribed the outcome of hypothetical situations to the causes internal to themselves, e.g. to their ability levels or their luck. The higher stability score suggests that children in the HFASD group may ascribe the

causes of social outcomes as constant over time, while the globality dimension implies that the negative outcome from one social situation may be ascribed to all other similar situations.

Previous research (Robins & Hinkley, 1989; Rooney et al., 2006) has shown that children who either do or do not believe that failures are caused by their lack of ability, differ in their predictions about the future outcomes; with the former tending to overemphasise their failures and underestimate their success (see Section 11.2). The HFASD group in Study 3, too, might thus be relying more on their negative social experiences to guide the prediction and interpretation of future situations, and their outcomes.

14.3 Appraisal dimensions associated with attributions over six months and one year time periods (Research Question 1)

Key points:

- The appraisals related to one's coping potential and expectancy about a situation's outcomes and the extent of self-responsibility assessed at the time of Studies 1 and 2 were associated with maladaptive attributions measured during Study 3, in the longer-term. However, fewer significant correlations were found in the TD group. This was a novel finding.

In the case of the HFASD group, the findings showed a significant association between the appraisal dimensions of self-accountability and future expectancy, assessed at Studies 1 and 2, and the three attribution dimensions of internality, stability, globality, as well as the average negative attribution style score. These findings informed the Research Question 1 of Study 3. The appraisal dimension of self-accountability had a positive correlation with attributions, while the appraisal of future expectancy had a negative association. This means that in the situations characterised by high scores on the appraisal related to desirable expectancies about

future outcome, the scores on negative attribution style were low, *i.e.* children in the HFASD group viewed the situation in a more positive manner. However, the situations with high scores on the appraisals related to the beliefs about self-responsibility for the cause of an event, the scores on negative attribution style were also high. Such an association between the appraisal dimensions and average negative attributions did not change with time in the HFASD group, as similar correlation coefficients were found at both the times for both appraisals studied one year (at Study 1) and six months previously (Study 2).

The other two appraisal dimensions of emotion-focused coping potential and problem-focused coping potential, examined during Studies 1 and 2, were negatively correlated with some attributions. For the appraisal dimension of problem-focused coping potential assessed at Studies 1 and 2, negative correlations were found with the globality attribution dimension and the average negative attribution style. Further, for the appraisal of emotion-focused coping potential, negative and significant correlations were found with all the three attributions and the average negative attribution style. However, the correlations between the appraisal of emotion-focused coping potential assessed at Study 1 and the attributions assessed one year later, during Study 3, were found to be non-significant. These findings suggest that in the case of the HFASD group, the appraisals related to the perceptions of one's ability to deal with the negative consequences of a situation might be negatively correlated with negative attribution style, when assessed at a gap of six months. However, the significance of this correlation might disappear at a longer time period of one year.

Taken together, these findings suggest that the appraisals of low expectancy, high self-accountability and low coping potential might be associated with the scores on negative attribution style, in longer term, in the HFASD group. Such a profile of appraisal dimensions in the HFASD group was also associated with the scores on negative affect and avoidance coping scores in Study 2 (see Chapters 9 and 10); and also significantly correlated with the scores on fear and anxiety in Study 1 (see Chapters 5 & 6). The occurrence of such appraisals may thus not only be associated with temporary situational distress, in terms of negative affect and ways of coping, but might also be linked to more stable negative cognitive attribution styles. These findings informed the Research Question 1 of Study 3, relating to the possible longer term association between attributions and appraisals in the HFASD group.

In contrast, for the TD group there were fewer significant associations between the appraisal and attribution dimensions. For the appraisals assessed during Study 1, a year previously, only the appraisals of future expectancy and emotion-focused coping potential had a significant negative correlation with two out of three attribution dimensions: internality, stability, and average attribution style score. Further, the only significant correlation for the appraisals assessed during Study 2 with attributions investigated at Study 3, six months previously, were between the appraisal of future expectancy and stability attribution dimension. It is therefore possible that situations that are appraised as low in expectancy are also characterised by more stable beliefs about the occurrence of such negative situations in the future. Although, much fewer significant correlations were found in the TD group, the findings are opposite to the pattern of significant correlations found in the HFASD

group, since a longer time gap between the assessment of appraisals and attributions revealed a higher number of significant associations, in the case of the TD group.

These findings from Study 3 therefore suggest that impaired appraisals may be associated with negative attributions in both the HFASD and TD groups, in longer-term. This relationship has not previously been studied in the HFASD group, so the current findings offer the potential for a new insight into how faulty appraisals may be associated with negative attribution style.

14.4 Are attributions associated with depressive symptoms? (Hypothesis 4)

Key points:

- Study 3 finding on significant, positive correlation between the three attribution dimensions and the scores on depressive symptomatology extends the available, limited research evidence on the attribution-depressive symptoms literature for children with autism.

In Study 3, the scores on depressive symptoms of the HFASD group were significantly associated to the scores on attribution dimensions, which provided support for the Hypothesis 4 of Study 3. This implies that negative social situations, which were ascribed to internal, stable and global causes by the HFASD group, might also be characterised by higher scores for depressive symptomatology. In previous research too, the use of negative attribution style, characterised by specific attributions of internality, stability and globality was shown to be associated with depressive symptoms in similar negative situations (Mezulis et al., 2004; Spence, Sheffield, & Donovan, 2002; also see Section 11.3). Similarly, in the case of the HFASD group, previously, the average negative attribution style has been shown to be significantly associated with depressive symptoms (Barnhill, 2001; Barnhill & Myles, 2001).

Study 3 findings therefore not only add to the existing literature on the relationship between the negative attribution style and depressive symptoms in the HFASD group, but also extend it to the findings on the relationship between specific attribution dimensions and depressive symptoms. Although, all the three attribution dimensions were significantly associated with depressive symptoms in the HFASD group, the stability dimension had the largest association to the scores on depressive symptoms. After the stability attribution dimension, internality and then globality attribution had the smallest association to the scores on depressive symptomatology. It is likely that how children in the HFASD group attributed the cause of a situation was somehow linked to their mental health and well-being.

Association between the attributions and scores on depressive symptoms was however not significant for the TD group. This finding is consistent with Study 2 findings about the non-significant correlation of the appraisals with the negative emotions, in the TD group. This is once again a curious finding, as previous research studies have shown a significant association between the attributions and depressive symptoms in TD children (e.g., Robins & Hinkley, 1989). The sample for Study 3 in both for the TD and HFASD groups consisted of children from Studies 1 and 2 (see Section 12.2 & Table 12.1). So, it is possible that these findings of non-association of the appraisal dimensions with the negative emotions and avoidance coping, and of the attributions and depressive symptoms, are only specific to the group of TD children, who took part in the current research (this issue is further discussed in the 3rd and 4th paragraph of Section 15.5).

14.5 Limitations

To investigate attribution dimensions, the CCSQ scale (Mezulis et al., 2006), consisting of six hypothetical negative social and academic situations was used. Children's cognitive attributions were thus assessed in specific artificial situations. This means that the children's scores on the attribution dimensions, presented in this study, might not accurately indicate their attributions in other real-life situations. These findings might thus remain restricted to specific situations of the kind used in Study 3 to provide insight into the HFASD group's attribution reasoning.

Another limitation in the design of Study 3 relates to the assessment of longer-term association between appraisals and attributions, which would have been stronger, if both these variables were assessed at both the times, *i.e.* attributions along-with appraisals measured in Study 2 and appraisals in addition to attributions assessed at Study 3. This would have allowed insights into the extent to which correlation between appraisals and attributions is stable across time and if there is any change over a time period of 6 months. However, while designing such an analysis, the possible time demands on participants will need to be considered.

14.6 Summary

The findings from Study 3 provided support for the hypothesis that the HFASD group had a negative attribution style characterised by high scores on the attribution dimensions of internality, stability and globality attributions. This attribution style was found to be significantly associated to the scores on depressive symptoms, in the HFASD group. The score on appraisal dimensions of emotion-focused coping potential, self-accountability and future expectancy, in the HFASD group, were also

found to be significantly associated with the scores on negative attribution style over the time periods of six and twelve months.

Chapter 15: Discussion of Studies 1, 2 and 3

15.1 Introduction

This chapter draws together the findings from Studies 1, 2 and 3. Study limitations, suggestions for future research and implications for families of children with autism will also be discussed.

15.2 Between group differences for appraisal dimensions and negative emotions

The key findings for this section are:

- The HFASD group had significantly higher mean scores for the appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and future expectancy, but lower mean scores for self-accountability than the TD group, in both Studies 1 and 2.
- The HFASD group had significantly higher mean scores on the fear and anxiety questionnaires in Study 1 and negative emotions of fear, guilt and sadness, in Study 2, in comparison to the TD group.

The current research was novel in being the first assessment of cognitive appraisals in a group of children with HFASD. The HFASD group was found to have significantly different scores for the appraisals characterised by significantly higher scores for the dimensions of motivational relevance, motivational incongruence, self-accountability, but lower for emotion-focused coping potential, problem-focused coping potential and future expectancy than the TD group. These findings were consistent across Studies 1 and 2, despite the fact that different methodologies being used: In Study 1 the ‘hypothetical frustrating vignette’ technique was used, whereas in Study 2, the technique of ‘narrative recall’ was used. In addition, there was a gap of six months between these two studies and the similar scores for appraisal dimensions, in both the groups, in Studies 1 and 2 suggest that the noted difference

between the HFASD and TD groups might remain stable over time. It should be noted that data from the appraisal dimension of problem-focused coping potential had a non-significant correlation between the face-to-face and telephone modes of data collection and so, the findings related to this appraisal dimension might not be reliable (for fuller discussion see Section 7.9 in Appendix 7).

Cognitive appraisals are the manner in which social situations are evaluated for the benefits/ harms presented in relation to one's goals, abilities and needs. Such appraisals are reported to be directly associated with the basic human emotions (Smith & Lazarus, 1993). The finding on significantly different appraisals in the HFASD group suggests that there could be a bias in the evaluation of the negative social situations, which might be related to the experience of negative emotions that this group commonly experiences. Specifically, the findings from Studies 1 and 2 suggested that children in the HFASD group might appraise adverse social situations differently than the TD group. The HFASD groups' appraisal style was reflected through higher scores on the appraisal dimensions of self-accountability and lower scores for the appraisals related to coping potential to deal with the adversities in a situation and low expectancy about its potential outcomes. Such a profile of appraisal dimensions characterised by high self-accountability, but lower emotion and problem-focused coping potential and future expectancy in negative social situations has already been shown to be associated with the occurrence of negative emotions and social difficulties in groups of children without autism (e.g., Grych & Fincham, 1993; Grych et al., 1998, 2000). Indeed, the HFASD group in the current study had significantly higher mean scores for the negative emotions of fear, guilt and sadness and the scores on these negative emotions were found to be associated with appraisal

dimensions in the HFASD group. So, cognitive appraisals might have an important role in the occurrence of negative emotions in the HFASD group. This is further discussed below in Section 15.3.

15.3 Association of appraisals with negative emotions

The key findings for this section are:

- The appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and future expectancy had a significant association with the negative emotions of fear, guilt and sadness, in the case of the HFASD group, while there were no significant correlations for the TD group. However, Study 1 showed significant correlations between the appraisals of motivational relevance, incongruence and emotion-focused coping potential and fear in the TD group.
- In Study 2, regression coefficients suggested that one unique appraisal might have the largest contribution to each negative emotion: for fear it was the appraisal of emotion-focused coping potential, self-accountability for guilt and future expectancy for sadness. Similar finding was shown by Study 1 in relation to fear.

In Study 1, the primary appraisal dimensions of motivational relevance, motivational incongruence and the secondary appraisals of self-accountability, emotion and problem-focused coping potential and future expectancy were significantly correlated with the negative emotions of fear and anxiety, in the HFASD and TD groups. These two primary appraisal dimensions are known to be essential for the occurrence of a negative emotion and their high mean values in the group of children with HFASD indicates a general occurrence of the negative emotions (Smith & Lazarus, 1993). In fact, it is the secondary appraisal dimensions that in combination with primary appraisals, determine which specific emotion will be experienced. So, in Study 2 linear regression analyses were carried out to test for the strength of association of the four secondary appraisals of self-accountability, emotion and problem-focused coping potential and future expectancy with the

negative emotions of fear, guilt and sadness. These three separate regression models consisting of the four secondary appraisal dimensions as the independent variables and each of the three negative emotions as the dependent variables were found to be significant for the HFASD group. However, this association between the appraisals and negative emotions was found to be non-significant for the TD group. This finding did not support the findings of Study 1, since a significant correlation was found between the appraisal dimensions and fear in the TD group.

For the HFASD group, there was one unique secondary appraisal dimension that had the largest and significant association with each of the three negative emotions: it was the appraisal of emotion-focused coping potential for fear, appraisal of self-accountability for guilt and the dimension of future expectancy for sadness. These findings for the HFASD group supported the findings of Study 1, whereby a negative association was found between emotion-focused coping potential and fear. The finding that only the appraisals of emotion-focused coping potential and self-accountability were the unique associative appraisals for fear and guilt, respectively, is also in agreement with previous research evidence for groups of children and adults without autism (e.g., Smith & Lazarus, 1993). However, when predicting sadness in children and adults without autism, problem-focused coping potential, as well as, future expectancy have been shown to have a significant association (Smith & Lazarus, 1993). As discussed before in Section 10.8.1, these findings could be due to a relatively smaller sample size, which prevented the findings on significance of the individual predictor variables. Or it could be that in the case of the HFASD group, the appraisal-emotion relationships are in fact different from that of the TD group. This issue thus needs further clarification through future research. These

preliminary findings have however highlighted an important, but relatively neglected area of research that needs to be followed up with future research in order to clarify the appraisal-emotion relationships in group of children with HFASD.

15.4 Factors associated with appraisals: action readiness

The key findings for this section are:

- In Study 1, there was a significant difference in the mean values of all the six appraisal dimensions across the *no action readiness*, *preparing to advance* and *preparing to retreat* conditions of the ‘hypothetical frustrating vignette’, in the case of both the HFASD and TD groups. The finding that the degree of action readiness might be associated with children’s appraisals is a novel finding for children with autism.

Study 1 investigated appraisals in response to the three action readiness conditions of the ‘hypothetical frustrating vignette’, as described in Section 4.6.3. Difference in mean values between the *no action readiness* and the *preparing to advance* conditions was found to be greater for the HFASD group than TD group for five appraisals, except for motivational incongruence. On the other hand, difference in means between the *no action readiness* and the *preparing to retreat* conditions was once again smaller for the HFASD group for the five appraisal dimensions, except for motivational incongruence. This suggested that not only did the HFASD and TD groups differ in their mean scores for the appraisal dimensions, but they also seemed to respond differently to the three action readiness conditions of the ‘hypothetical frustrating vignette’.

Further, the appraisal of self-accountability seemed to have a higher mean score in the *preparing to retreat* condition, but lower mean in the *preparing to advance* condition, compared to the *no action readiness* condition, in the case of both the HFASD and TD groups. On the other hand, the appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and future expectancy

appeared to have higher means in the *preparing to advance* condition, but lower mean scores in the *preparing to retreat* condition, in comparison to the *no action readiness* condition. Previous research has also shown similar findings in typically developing groups (e.g., Frijda et al., 1989), so these findings suggest a new direction and an innovative technique of assessment for cognitive appraisals in children in HFASD, through the designing of vignettes varying in perceived emotional action readiness levels.

15.5 Association of appraisals with avoidance coping in the HFASD group

The key findings for this section are:

- The HFASD group had significantly higher scores for avoidance coping, but lower for approach coping and social difficulties than the TD group.
- All the four secondary appraisals had a significant correlation with avoidance coping in the HFASD group, while these associations were non-significant for the TD group.
- Avoidance coping had a negative correlation with the social difficulties scores, but in the case of the HFASD group only.

Coping was also assessed in Study 2 using the self-report KIDCOPE scale (Spirito et al., 1988). Children in the HFASD group were found to have significantly higher scores for avoidance coping, but lower for approach coping, compared to the TD group. This means that children in the HFASD group might avoid dealing with negative social situations, while children in the TD group might try and think of solutions and act directly to make the negative situation less unpleasant. This finding was consistent with previous research results about higher scores for avoidance coping in children with HFA/AS (e.g., Gupta & Sharma, 2005; Konstantareas & Stewart, 2006). Such avoidance patterns of coping have been shown to be associated with the occurrence of social difficulties in groups of children without autism, too (e.g., Recklitis & Noam, 1999; Rossman, 1992; also see Table 7.1). These findings

from Study 2 therefore suggest a possible relationship between avoidance coping and social difficulty in the HFASD group, too. Indeed, in Study 2 as well, avoidance coping was found to have a significant and positive association with social adjustment difficulties in the case of the HFASD group.

Study 2 further found that appraisals in the HFASD group were significantly associated with avoidance coping. This relationship has previously been shown to be significant in groups of children without autism (e.g., Causey & Dubow, 1992; Rogers & Holmbeck, 1997; also see Table 7.2), but no research had previously been carried out with group of children with HFASD. Regression coefficients indicated that only the appraisal of emotion-focused coping potential had a significant and negative association with avoidance coping. On the other hand, in the case of the TD group, the linear regression model, consisting of the independent variables of the four appraisal dimensions of emotion-focused coping potential, problem-focused coping potential and self-accountability, was found to be non-significant for the dependent variable of avoidance coping. This finding for the TD group was surprising, since previous research has shown appraisals to be significantly associated with avoidance coping as well (e.g., Gamble, 1994; Kliewer, Fearnow, & Walton, 1998).

It is interesting to note here that in the case of the TD group in Study 2, appraisals were also found to be non-significantly associated with other negative variables, such as the negative emotions of fear, guilt and sadness and social difficulty score obtained from the PSC scale (Jellinek, 1986). Similarly in Study 3, regression output between attributions and depressive symptoms was non-significant for the TD group. These associations were however, once again significant for only the HFASD group.

A possible reason for such findings about the non-significance of associations between appraisals, negative emotions, avoidance coping and social adjustment difficulties, in the case of the TD group could be due to floor effect in data (Howell, 2007). It means that the scores of TD group were clustered around the lower end of the distribution that could have restricted the ability of the statistical tests to show significant associations. This becomes clearer when rating scale on the measurement techniques is considered.

For example, in the KIDCOPE scale that was used to measure the frequency of coping strategies used, there was a bipolar scale of *yes-no*. Most children in the TD group responded *yes* for the items relating to the variable of approach coping and marked *no* for the items related to avoidance coping strategies. Similarly, on the appraisal and emotion questionnaires in Study 2, the rating scale ranged from 0-3. Most children in the TD group marked 0 or 1 on the scale for the appraisal dimension of self-accountability and the negative emotions of fear, sadness and guilt. This could have resulted in floor effect and caused the association with other variables to be non-significant. On the other hand, in Study 1, where the rating scale for the appraisals and fear questionnaires was much longer and ranged from 0-11, the TD children's responses were more scattered along the scale. Consistent with this argument, associations between fear and appraisals were also higher in number for the TD group in Study 1. So, it is possible that there were significant associations of the scores on appraisals with negative emotions, avoidance coping and negative attribution style, but these could not be identified due to floor effect in data.

15.6 Association between appraisals, attributions and depressive symptoms

The key findings for this section are:

- The HFASD group had significantly higher scores for the attribution dimensions of internality, stability and globality; and higher scores for the average negative attribution style and depressive symptomatology than the TD group.
- All the four appraisal dimensions assessed at Studies 1 and 2 had a significant association with the average negative attribution style score, albeit for the HFASD group only.
- Fewer significant correlations were found between the appraisal dimensions and attribution dimensions, in the HFASD group. Only one significant correlation in the TD group, while previous research has shown possible associations in TD children too.

Children in the HFASD group had significantly higher scores for the depressive symptoms and negative attribution style as indicated by their high scores for the dimensions of stability, internality and globality attributions. These findings indicate that children in the HFASD group might have a stable cognitive style, whereby they attribute the cause of negative events to internal factors and believe that such negative experiences may happen over time, across different contexts. Such an attribution style has been shown to be predictive of the occurrence of depressive symptoms in children without autism (e.g., Harriet et al., 2008) and with autism (e.g., Barnhill, 2001); and was indeed associated with the scores on depressive symptomatology in the HFASD group, in Study 3 as well. This finding suggested that if the causes of negative events are attributed to factors internal to oneself and if these are seen to be stable across varied contexts and over time, depressive symptoms might co-occur in the HFASD group.

The findings from correlation analyses carried out in Study 3 for an assessment of the relationship between the appraisals assessed at Study 1 (12 months earlier) and

later attributions showed a significant association between appraisals and attribution dimensions of internality, globality and stability. Specifically, for the HFASD group, the findings suggested that the negative situations characterised by high scores for the appraisal of expectancy about the desired outcomes and low scores for self-accountability, might also feature lower scores for the negative attributions. The findings also suggested that in the HFASD group, scores on the negative attribution style, whereby, negative events are viewed as unalterable, might be relatively lower in negative situations that have higher scores for the appraisal of emotion-focused coping potential, *i.e.* the belief in one's ability to deal with that situation. However, in the case of the TD group, fewer significant correlations were found. The findings in the case of the TD group suggested that in negative social situations with relatively higher scores on the appraisals of future expectancy and emotion-focused coping potential, scores for negative attribution style might be low. Other appraisals of problem-focused coping potential and self-accountability had a non-significant association with the negative attribution style score in the TD group.

Similar findings were shown for association between appraisals assessed at Study 2 and negative attribution style investigated six months later, at Study 3. For the HFASD group, all the four appraisal dimensions of emotion-focused coping potential, problem-focused coping potential, self-accountability and future expectancy were significantly associated with the average negative attribution style score. The significance of associations between these appraisals and the specific attribution dimensions however varied. The appraisal dimensions of emotion-focused coping potential had a non-significant correlation with the internality and stability attributions and problem-focused coping potential had a non-significant association

with the internality attribution dimension. Significant associations in the HFASD group meant that in the situations with high scores on the appraisals of future expectancy, but low scores for self-accountability, scores for the extent to which children with HFASD attributed the negative events to be unalterable and relatively permanent over time were also low. For the TD group, once again, there were very few significant correlations, this time only one: between the appraisal of future expectancy and stability attribution dimension. This suggests that the appraisal-attribution associations might be different across the HFASD and TD groups.

To recall in Studies 1 and 2, these appraisals were found to be associated with negative emotions and avoidance coping; and in Study 3, appraisals were associated with negative attributions in the longer-term. Taken together, these findings therefore suggest that a profile of appraisal dimensions characterised by low scores on emotion-focused coping potential, low scores on problem-focused coping potential, low scores for future expectancy, but high scores for self-accountability, might be associated with a higher occurrence of many more negative social attributes than just negative emotions, in the HFASD group.

15.7 Limitations

Some limitations in Studies 1, 2 and 3 were noted in the discussion chapters for each of these three studies. The limitations identified in Studies 1 and 2 were used to inform the research design of the subsequent studies, for example, cognitive appraisals were reassessed in Study 2 with a larger sample size and improved methodology (see Section 7.8). However, the current research consisting of three linked studies still had some limitations, which indicate the need to exercise caution while interpreting the findings from the current research; these are discussed below.

15.7.1 Artificial settings used: Structured and artificial settings were used throughout Studies 1, 2 and 3 for assessment of the variables of appraisals and attributions; in Studies 1 and 3, hypothetical vignettes were used and in Study 2 children were asked to recall a past negative situation (see Sections 8.4.1 & 12.3.1). The children's responses might therefore be different, if assessed in more naturalistic settings. This might however be a problem inherent to most research studies as obtaining information in real-life settings might need to rely mostly on observation data, which might be subject to observer bias (Gall, Borg & Gall, 1996). On the other hand, direct measures of the kind used in the current study are known to be generally preferred by the research participants because of their un-obtrusive nature and less burden on participants. These are also more practical and convenient for a researcher and might involve lower administration costs (O'Leary, Kent, & Kanowitz, 1975). Indeed, similar techniques have been widely used in other research studies for children with autism too. Further, techniques used in the current research are the standard methods commonly used for the assessment of appraisals and attributions. In fact, the technique of 'narrative recall' might not be considered as an artificial setting as children are simply asked to recall a past real-life experience and then they are asked questions about it. To further minimise any discomfort or bias in the findings, due to the HFASD children's difficulty in interacting with people and adjusting to new social settings, the questionnaires were administered at child's home, which was considered to be familiar and thus a comfortable setting for children.

15.7.2 Small sample size: This issue has previously been discussed in Study 2 under Sections 9.5 and 10.5, and as a limitation of the Study 2 findings in Section

10.8.1, so will be discussed very briefly here. The sample size in all the three studies of this research was based on the results of power-size calculations and thus the numbers of participants in Studies 1, 2 and 3 were considered adequate for the kind of statistical analyses required for investigating the concerned hypotheses. It is however important to note that although the association between appraisals and negative emotions were found to be non-significant in the TD group, the effect size for the same analyses varied from small-to-medium. So, it is possible that if re-investigated with a larger sample size, the finding of non-significant associations in the TD group between appraisals and negative emotions might be statistically significant.

15.7.3 Adaptation of standardised scales: In Study 1, the technique of ‘Strange Stories’ (Happè, 1994) was adapted to replace the pencil sketches with clipart pictures, in an attempt to provide a clearer illustration of the hypothetical social stories for children with HFASD. The adapted scale was not tested in the additional study by administering it on a separate group of children with HFASD, so the finding could be biased. However, the new clipart pictures were assessed for their degree of accuracy in illustrating social stories using an inter-rater reliability check, so the chances of such a bias occurring are low.

15.7.4 Data from the appraisal dimension of problem-focused coping potential might be biased: Due to the practical problems in recruiting the required number of families with a child with HFASD in the local area of Scotland, testing with some children were carried out over telephone. This non-standard data collection technique was assessed for accuracy in the additional study (see Appendix 7). In the case of problem-focused coping potential, the correlation coefficient between the face-to-face and telephone testing modes was non-significant for the HFASD group. It

means that data from this appraisal that was collected over telephone in Studies 1 and 2 might be biased and unreliable. Nevertheless, data for all the other variables correlated well between the two modes of testing for both the groups (for further discussion and the full list of results, see Section 7.8 & 7.9 in Appendix 7).

Despite such limitations, it can nevertheless be argued that the present research advances current understanding and provides a preliminary conceptual base for explaining the cognitive bases of emotional and coping choices in a small group of children with HFASD. Also, the findings on this area have immense potential for further extension and replication through future research.

15.8 Implications

The current doctoral study was the first examination of appraisal dimensions in a group of children with HFASD and it was found that the scores on appraisals in this group were significantly different than the scores of the TD group; and had a significant association with the negative emotions, avoidance coping and negative attributions. These findings therefore suggest that the intervention programmes aimed at altering these specific appraisals could help improve the social well-being of children with HFASD. Although, there is no intervention programme specifically aimed at changing faulty cognitive appraisals in children with HFASD, some are indeed in place for other groups of children, and have been shown to lead to significant improvements in social adjustment: for example, for groups of children from families with parental divorce (e.g., Mazur, Wolchik, & Sandler, 1992; Pedro-Carroll & Jones, 2005) and for groups of children who are maltreated and injured at home or in educational institutions (Azar & Weinzier, 2005).

Further, in Studies 2 and 3, significantly different mean scores were also found for the variables of coping and attributions in the HFASD group compared to the TD group. Unlike appraisals, coping and attributions have been investigated in children with HFASD previously, but there are no intervention studies and therefore, no evidence on how to improve these deficits in children with HFASD. There are however empirically tested and validated intervention programmes for the improvement of attributions and coping for children without autism. For example, the Pedro-Carroll's Children of Divorce Intervention Program (Mensah & Fine, 2008; Pedro-Carroll, 1994; Pedro-Carroll & Jones, 1995) is a school-based intervention programme for children whose parents have divorced. This programme addresses children's attributions relating to their parents' divorce and helps reduce appraisals of self-blame, and improves their ability to realistically plan coping strategies for dealing with the emotional stress. Similarly, the Stolberg's Children's Support Group (Stolberg & Mahler, 1994) that lasts over a period of 14 weeks is a structured intervention designed to improve appraisals, specifically self-blame and coping potential, and also coping choices of children of divorce. These intervention programmes have been empirically evaluated and shown to significantly improve social adjustment in children from the families of parental divorce (Greene et al., 2006; Haine, Sandler, & Wolchik et al., 2003; Sandler, Tein, & Mehta et al., 2000). Although, the target group for these intervention programmes were different from children with autism, both these groups of children (those with autism and the ones from the families with parental conflict) exhibit similar difficulty in the cognitive evaluation of social situations, and exhibit excessive anxiety and related disorders (see Table 3.1). So, these might serve as a starting base to develop new models

aimed at improving similar deficits in coping and attributions of children with HFASD.

The above intervention programmes used the techniques of hypothetical stories, narrative recall, modelling, make-believe plays, skill instructions, stimuli of pictures and cartoons to modify the target cognitions and behaviours. Such techniques have been shown to be successful in intervention programmes for children with autism, too (e.g., Attwood, 1998; Goldstein et al., 1997; Rogers, 2000). For example, cartoons and pictures are commonly used in the interventions for improving TOM ability in children with autism (e.g., Silver & Oakes, 2001). The cognitive behaviour therapy programmes have also been shown to be successful in reducing the occurrence of anxiety and stereotyped, ritualistic behaviour patterns in children with autism (e.g., Chalfant, Rapee, & Carroll, 2007; Reaven & Hepburn, 2003; Sofronoff, Attwood, & Hinton, 2005; Sze & Wood, 2007; Wood, Drahota, & Sze et al., 2009). This suggests that there is a considerable potential to adapt for children with HFASD, the existing cognitive skill based and behaviour interventions that have been used for improving attributions and coping in other groups.

15.9 Suggestions for future research

Although, the findings from the current Studies 1, 2 and 3 are useful in being the first investigations of appraisals in a group of children with HFASD, they can only serve as the starting point for further exploration and theory-building in this relatively new and emerging area of thought. Some suggestions for extending these findings from Studies 1, 2 and 3 are given below.

15.9.1 Causal relationships: The current study was unique in showing impairment in appraisal dimensions and its significant association with TOM ability, the negative emotions of fear, anxiety, guilt, sadness, avoidance coping and the negative attribution style in children with HFASD. Previous research (see Tables, 3.2 & 7.2) has shown similar relations between appraisals and these variables to be significant, but in the case of groups of children without autism. The inverse relationship has also been shown to be true, where people who exhibited excessive anxiety tend to appraise social situations in idiosyncratic ways, characterised by high self-accountability, low future expectancy and low coping potential (e.g., Schniering & Rapee, 2004; Summerfeldt & Endler, 1998). It is then possible that because children in the HFASD group exhibited a higher frequency for the negative emotions of fear, guilt and sadness, they appraised the negative social situations as low in coping potential, future expectancy but higher in self-accountability. This means the negative emotions could be predictive of appraisals, something that can be explored by future research. However, the findings from the current cross-sectional study do not suggest the direction of causal relationships between any of these variables.

So, the possibility that the appraisal dimensions might be predictive of negative emotions, avoidance coping and negative attributions or vice versa in children with HFASD might be of interest to related future research. Similarly, although in the current study, appraisals were found to be associated with avoidance coping, an investigation of the causal relationship between these two variables remains open for future investigation. Also, previous research have shown that people who use avoidance patterns of coping tend to appraise those situations as being low in coping

potential and expectancy. This inverse relationship could therefore also be true in children with HFASD and could perhaps be investigated in future research.

Study 3 found attributions to be significantly associated with the scores on depressive symptoms in the HFASD group. Other studies too have found that people with depression used negative attribution style in negative situations (e.g. Gladstone & Kaslow, 1995). Indeed in Study 3 too, higher scores for the negative attribution style were found to co-occur with high scores on the test of depression, in the HFASD group. This issue also relates to the extent to which a cross-sectional study design can account for the prediction of the direction of the relationship between any two variables. In Study 3, since the initial levels of the outcome variable, *i.e.* the scores on depressive symptoms were not controlled, thus it is not possible to assess whether the scores on depressive symptoms in fact predicted negative attributions in the HFASD group. So, the findings from Study 3 only suggest that the association between the negative attributions and depressive symptoms; and the causal relationship needs to be investigated through future research.

Symptoms of depression have also been shown to be linked with appraisals, where people with depression were shown to appraise social events as low in coping potential and expectancy, but high in self-accountability (e.g., Bugental & Cortez, 1993; Wenzlaff, Wegner, & Roper, 1988). Once again, in the groups of children without autism, the reverse relationship, whereby appraisals caused depressive symptoms has also been shown to be significant (Jouriles, Spiller, & Stephens et al., 2000). Taken together, these findings from the current and previous research suggest possible, multiple interaction between the variables of appraisal dimensions, negative

emotions, coping, attributions and depressive symptoms. Such investigations can be pursued in future research studies.

15.9.2 Issue of matching: Children in the HFASD group were matched with TD children on the variables of age, gender and IQ and no significant differences were found between the two groups. So, any noted differences between the two groups for the scores on appraisals, negative emotions or other social attributes examined in Studies 1, 2 and 3 were interpreted as impairment in the HFASD group, since their performance was either above or below the expected levels of performance. Little can however be known from these findings about whether such impairments were symptomatic relative to the child's age or their developmental level, *i.e.* is the impairment in cognitive appraisals a deviancy or a developmental delay? This can be achieved by the designing of studies where the HFASD is group matched with the group of children with other developmental delays, matched for their mental age and typically developing children matched for their chronological age (Shaked & Yirmiya, 2004).

For example, Gupta and Sharma (2005) matched a small group of children with autism for their developmental age with a group of children with cerebral palsy (no intellectual impairment) and typically developing children. Such a design allowed the findings of fears that were unique to the group of children with autism (such as, textures, crowds) and cerebral palsy (e.g., falling, walking), respectively. Another study by Evans et al. (2005) matched children with autism to a group of children with Down Syndrome, a group of chronologically age matched TD children and another group of mentally age matched TD children. Their study could also show fears specific to the autism group, since any noted differences between the autism

and other groups were clearly attributable to the specific condition of autism. Such a design might thus allow revelation of the peculiar pattern of cognitive appraisals, if any, in children with HFASD.

15.9.3 Predictions studied over longer time period: One of the aims of Study 3 was to examine association of the appraisals with negative attributions in longer term. For this, attributions were assessed at a gap of one year from Study 1 and six months from Study 2. Such a time gap is however relatively short to identify any developmental changes, thus a longer time gap between the assessment of appraisals and attributions, might reflect associations in longer-term more accurately. Longitudinal studies could also mean that the initial levels of outcome variables can be controlled, thus further strengthening the research design (Gottman & Rushe, 1993).

15.9.4 Variation in the type of measures used: The studies' hypotheses could also be reinvestigated with different measures in the future studies. Appraisals and the negative emotions of fear, guilt and sadness in Studies 1, 2 and 3 were assessed with single item scales, originally used by Smith and Lazarus (1993). However, single-item scales might be subject to a higher level of measurement error than that typically expected in multi-item measurement scales. So, it might thus be useful to reassess appraisals with multidimensional measures such as, the CPIC scale (Grych et al., 1992), which consists of nine items to assess appraisals of self-blame; and 12 items for appraisals related to threat; the latter sub-scale also includes items to assess appraisals of coping potential and expectancy. The Stress-Appraisal measure developed by Peacock and Wong (1990) is also a 37 item measure that assesses six different appraisal dimensions such as, threat, challenge and controllability by self or

others. Such assessments will however need an adaptation for children with HFASD as both the scales contain specific items relating to the experiences of inter-parental conflict. Researchers (e.g. Theunissen, Vogels & Koopman et al., 1998) have also argued that parent-reports are more stable than child-reports, so the use of a parent-report scale in addition to a self-report scale might provide a more reliable assessment of coping choices by children with HFASD.

15.9.5 Limitations of the structural appraisal model in understanding emotional experience: Smith and Lazarus (1993)'s was one of the pioneering studies on association between cognitive appraisals and emotional experiences. Despite being very influential in the research on cognitive underpinnings to emotions, certain limitations were identified. Mostly, it was argued that the structural appraisal model only focuses on the components of social evaluation process and that it has failed in capturing the dynamic nature of emotional experiences (Scherer, Schorr, & Johnstone, 2001). Following such criticisms, it was proposed that the automatic unconscious processes related to past memories might get linked to the confronting social stimuli and may be important determinants for the occurrence of an emotional feeling (Smith & Kirby, 2001). Further, biological factors have also been shown to be crucial in determining the affective and cognitive responses (Izard, 1993). Especially in the case of fear, defects in the brain structures of amygdala and thalamus are known to be responsible for its occurrence (LeDoux, 1992, 1996). Also, other factors such as parental influences and personality variables may also be associated with emotional experiences, which were not included in the structural appraisal model, proposed by Smith and Lazarus (Barrett, 2005). So, the findings of the current study are therefore limited in their scope for explaining the occurrence of

negative emotions in children with HFASD. However, these findings provide useful, preliminary insights into one of the several possible correlates of emotional experience. Future research can thus replicate and extend the findings of the current research to an investigation of additional factors known to be associated with negative emotional experiences in children with autism.

15.10 Summary

This chapter discussed the key findings from the current research namely, the significantly different scores between the two groups for, and association between the variables of appraisal dimensions, negative emotions, avoidance coping; and the presence of negative attribution style in the HFASD group. Although there are no intervention programmes for helping children with HFASD to address their maladaptive appraisals, knowledge from the research on appraisals in the groups of children without autism, can be utilised. Some limitations, such as the nature of measurement tools used and small sample size, were identified; and the suggestions for future research were also discussed.

Chapter 16: Conclusion

The current research consisted of three linked studies. Children in the HFASD group were found to have significantly different appraisals compared to children in the TD group. Although, appraisals have previously been shown to be associated with negative emotions in groups of children without autism, the current research is the first to investigate these issues amongst children with HFASD. The association between appraisal dimensions and TOM ability in children with HFASD, was also assessed in Study 1. It is also the first study to show a significant association of TOM ability with the appraisal dimensions of motivational relevance, motivational incongruence, emotion-focused coping potential, problem-focused coping potential and future expectancy, in the HFASD group. Such a profile of appraisal dimensions has been shown to be associated with negative emotions and social difficulties in groups of children without autism. The findings showed that the scores on TOM ability tasks were negatively associated with the appraisal dimensions related to coping potential and future expectancy. On the other hand, a positive association was found between TOM ability and the appraisal dimensions of motivational relevance and incongruence. These associations were significant for both the HFASD and TD groups. This is thus an important finding, as previous research findings on the intervention programmes for improving TOM ability in children with HFASD can be used as a starting base for developing further research studies aimed at designing and testing of intervention programmes for children with HFASD.

Children in the HFASD group appraised negative social situations as lower in coping potential, lower in future expectancy and higher in self-accountability. This

means that children in the HFASD group compared to children in the TD group, perceived themselves to be less capable of dealing with the appraised harms in negative situations studied and had lower expectation about the situations' outcomes; and that they also believed that they were responsible for that negative event. Such a profile of appraisal dimensions was found to be significantly associated with anxiety, fear, guilt, sadness, avoidance coping and negative attribution style in the HFASD group. Other findings provided support for the existing research evidence relating to children with HFASD by showing a significantly higher occurrence of the negative emotions (fear, guilt and sadness), avoidance coping, negative attribution style (high internality, stability, and globality), and higher scores for the test of depression, in comparison to the TD group.

The examination of appraisals was extended to include assessment in the *no action readiness, preparing to advance* and *preparing to retreat* conditions of the 'hypothetical frustrating vignette'. The HFASD group maintained significantly higher mean score for the appraisal dimensions of motivational relevance, motivational incongruence, but lower mean scores for emotion-focused coping potential, problem-focused coping potential and future expectancy across the three action readiness conditions. Mean scores for the appraisals of emotion-focused coping potential, problem-focused coping potential and future expectancy also appeared to be higher in the *preparing to advance* condition, but lower in the *preparing to retreat* condition compared to the *no action readiness* condition. An opposite change in means was observed for the other three appraisals. These findings on appraisals were re-examined in Study 2 with a different methodology of 'narrative

recall', the technique that was less dependent on the perspective-taking ability of children with HFASD.

In Study 2, the cognitive appraisals were also assessed in relation to the coping choices made in negative social situations in Study 2. Unlike appraisals, the variable of coping has previously been discussed in literature and limited research evidence indicated frequent use of avoidance coping by children with HFASD. Findings from the current study supported previous research as the HFASD group reported a higher frequency for the use of avoidance coping strategies for the management of negative social situations. In contrast, the TD group reported a significantly higher use of approach coping strategies. Scores for the perceived effectiveness of these coping strategies were also significantly lower for the HFASD group than the TD group. It means that in general, the coping choices of the HFASD group were perceived to be ineffective for adjustment in the negative social situations. Indeed, avoidance coping was found to be associated with social difficulties in the case of the HFASD group.

In addition to these findings, Study 2 provided a new direction to the existing pool of limited research findings, showing a significant association between the appraisal dimension of coping potential and coping choices in the HFASD group. This finding suggested that in the case of the HFASD group, if in a situation, the appraised coping potential for dealing with the negative social situation was low, than the actual coping strategy used was also be maladaptive, *i.e.*, avoidance strategies might be chosen instead of more healthy problem-focused coping techniques.

Associations between the appraisals assessed at Studies 1 and 2 with the attribution style scores measured at Study 3, were investigated at the gaps of one year

and six months, respectively. The appraisal dimensions of emotion-focused coping potential, problem-focused coping potential, self-accountability and future expectancy were found to be significantly associated with negative attribution style, in the HFASD group. This finding indicated that maladaptive appraisals in negative situations might be linked to the development of a more stable cognitive style, whereby the occurrence of negative events is believed to be stable across time, contexts and attributed to one's own lack of ability. Such a negative attribution style consisting of high scores for the dimensions of internality, stability and globality was also found to be significantly associated with scores on the symptoms of depression in the HFASD group.

These findings have thus highlighted a new and relatively undeveloped area of research on appraisals in the HFASD group and their association with negative emotions of fear, sadness and guilt, avoidance coping and negative attribution style. These findings might have the potential to inform the development of new intervention programmes to help children with HFASD correct their faulty perceptions of negative social situations.

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Appendix 1: Information sheet for parents of children with HFASD

Dear parent,

I am a PhD student carrying out research into how children with Asperger Syndrome cope with emotions, under the supervision of Dr Lisa Woolfson, Reader in Psychology. I need to recruit a group of children with Asperger Syndrome aged 8-12 years. The results are intended to help parents, caregivers and other professionals help children with Asperger Syndrome to cope better with daily life social challenges and greater insights about the dynamics of emotional experiences of fear and anger. Results will be made available to you shortly after the completion date of September 2009. Your child will be invited to take part in different activities and fill in some questionnaires. It will take around 1 hour. Your child's responses will be audio-recorded and then transcribed so that I can study them later.

- One activity involves questions about some stories about daily situations like participating in a painting competition, visiting a friend's home
- Another involves asking your child to give a description of a past emotional experience.
- In the next activity your child will read with me a story about a frustrating situation and answer some questions about any feelings of anxiety.

You too will be invited to fill in two questionnaires, one designed to measure any anxiety experienced by your child and the other to measure the kind of coping techniques your child uses to deal with difficult situations in daily life. This will take around 15 minutes of your time. The study will be carried out in the Department of Psychology, University of Strathclyde. However, if you have any difficulty coming to the department it may be possible for me to come to your child's school instead.

All data collected will be treated with strictest confidence, will be stored in locked cabinets within the University and destroyed after the study is complete. The study has been approved by University of Strathclyde Ethics Committee. I will give you a copy of a handout "Fear in children with special needs" from my masters' dissertation (which has already been published), as well as my hearty thanks. Even after you agree to take part if you then change your mind later, you can stop at any time for any reason. If you are willing to take part, please sign the attached consent form and post it back **as soon as possible** in the envelope provided or let me know by tel/email and we can then arrange to meet. If you have any questions please contact me at the Dept. of Psychology on tel: 0141 548 2873 or email: shilpi.gupta@strath.ac.uk.

Thank you,

Shilpi Gupta

Appendix 2: Participant information sheet for parents

Dear parent,

I am a PhD student carrying out research into how children aged 8-12 years cope with emotions, under the supervision of Dr Lisa Woolfson, Reader in Psychology. I need a group of normally developing children to fill in a few questionnaires, so that I can compare them with coping in children who have Asperger Syndrome.

Your child will be invited to take part in different activities and fill in some questionnaires. It will take around 25-30 minutes.

- One activity involves questions about some stories about daily situations like participating in a painting competition, visiting a friend's home
- Another involves asking your child to give a description of a past emotional experience.
- In the next activity your child will read with me a story about a frustrating situation and answer some questions about any feelings of anxiety.

I will come to your child's school to help you and your child complete the questionnaires in a quiet room. All data collected will be treated with strictest confidence, will be stored in locked cabinets within the University and destroyed after the study is complete. The study has been approved by University of Strathclyde Ethics Committee and Glasgow City Council.

If you are willing to take part, please sign the attached consent form. If you have any questions please contact me at the Dept. of Psychology on tel: 0141 548 2873 or email: shilpi.gupta@strath.ac.uk.

Thank you,

Shilpi Gupta

Appendix 3: Participant information sheet for child with HFASD

Dear child,

I am a PhD student carrying out research into how children with Asperger Syndrome cope with emotions under the supervision of Dr Lisa Woolfson, Reader in Psychology. I need to recruit a group of children with Asperger Syndrome aged 8-12 years. The results will provide greater insights about the dynamics of emotional experiences of fear and anger. Results will be made available to you shortly after the completion date of September 2009.

You will be invited to take part in different activities and fill in some questionnaires. It will take around 1 hour.

- One activity involves questions about some stories about daily situations like visiting a friend's home etc.
- Another asks you to describe a past emotional experience

In the next activity I will read a story about a frustrating situation and you will be asked some questions about any feelings of anxiety.

Your responses will be audio-recorded and your talk will be transcribed. The study will be carried out in the Department of Psychology, University of Strathclyde. However, if you have any difficulty coming to the department it may be possible for me to come to your school instead.

- All data collected will be treated with strictest confidence, will be stored in locked cabinets within the University and destroyed after the study is complete.
- The study has been approved by University of Strathclyde Ethics Committee.
- You do not need to take part in this study. Even if you agree to take part and then change your mind later, you can stop at any time for any reason.

If you have any questions please ask your mother to contact me at the Dept of Psychology on tel: 0141 548 2873 or email: shilpi.gupta@strath.ac.uk.

If you are willing to take part, please sign the attached consent form and ask your mother to post it back as soon as possible in the envelope provided or let me know by tel/email as above and we can then arrange to meet.

Thank you

Shilpi Gupta

Appendix 4: Participant information sheet for TD child

Dear child,

I am a PhD student carrying out research into how children aged 8-12 years cope with emotions. I need a group of normally developing children to fill in a few questionnaires, so that I can compare them with coping in children who have Asperger Syndrome.

You will be invited to take part in different activities and fill in some questionnaires. It will take around 1 hour.

- One activity involves questions about some stories about daily situations like visiting a friend's home etc.
- Another asks you to describe a past emotional experience
- In the next activity I will read a story about a frustrating situation and you will be asked some questions about any feelings of anxiety.

Your responses will be audio-recorded and your talk will be transcribed. I will come to your school to help you complete the questionnaires in a quiet room.

All data collected will be treated with strictest confidence, will be stored in locked cabinets within the University and destroyed after the study is complete. The study has been approved by University of Strathclyde Ethics Committee.

- You do not need to take part in this study. Even if you agree to take part and then change your mind later, you can stop at any time for any reason.
- If you have any questions please ask your mother to contact me at the Dept of Psychology on tel: 0141 548 2873 or email: shilpi.gupta@strath.ac.uk.
- If you are willing to take part, please sign the attached consent form and ask your mother to post it back as soon as possible in the envelope provided or let me know by tel/email as above and we can then arrange to meet.

Thank you

Shilpi Gupta

Appendix 5: Consent form for parents

Research into emotions of children with and without
Asperger Syndrome

PARENT CONSENT FORM

- I have read the information sheet and have had the opportunity to ask questions.
- I know that my participation and that of my child is entirely voluntary and I, or my child, can withdraw at any stage of the study without having to give a reason and that this will not affect my child's education in any way.
- I have been assured that the data will be treated with strictest confidence.

I agree to take part in the study

Name:

Address:.....
.....
.....
.....
.....

Phone:

Email:

Appendix 6: Consent form for children

Research into emotions of children with and without Asperger
Syndrome

CHILD CONSENT FORM

- I have read the information sheet and have had the opportunity to ask questions.
- I know that my participation is entirely voluntary and I can withdraw at any stage of the study without having to give a reason and this will not affect my education in any way.
- I have been assured that my answers will be treated with strictest confidence.

I am happy to take part in the study (please click on one of the following)



Name:



Shilpi Gupta

Appendix 7: Additional study

7.1 Objectives

The aims of this additional study were:

1. To collect additional data to evaluate the extent to which data collected by telephone correlated well with data collected face-to-face.
2. To collect additional data in order to assess the significance of the difference between data from the non-Hindu and Hindu children.

7.2 Addressing the possible confounding variable of telephone data collection

Due to the practical problems in recruiting and accessing the required sample for this study, locally, data from nine children in the HFASD group and ten in the TD group were collected via telephone with parents located in the same room as the child to help with administration, if required. As this is a non-standard method of data collection, it was important to establish the extent to which responses gathered using this method were correlated with those gathered in the face-to-face interviews, using more standardised methods. For this purpose, an additional sample of HFASD and TD participants, who were not involved in Studies 1, 2 or 3, were recruited and a representative sub-set of child self-report scales was administered twice to this new group: once face-to-face and once on telephone, with parental support available, if required. Ethics approval from the University ethics committee was obtained for carrying out this additional study (Reference number: UEC0910/14). A sub-set of scales was selected for this study in order to ensure a realistic and acceptable time commitment for children and families, especially as they were required to undertake

each activity twice. A description of the selected scales used will be presented in Section 7.7 below.

7.3 Addressing the possible confounding variable of ethnicity

In Study 1, the TD group included eight children from the Hindu community and five children from this ethnic minority group continued their participation into Studies 2 and 3. This was a considerable proportion of the total sample size of 28-42 in the three studies, which may have biased the findings. For example, children from the Hindu background might have been taught different values that could have biased their responses to the scales involving social situations. Thus this additional study was carried out to address both the above issues of telephone testing and also that of data collection from an ethnic minority group.

7.4 Sample selection for the additional study

Children and families who took part in Studies 1, 2 and 3 were not asked to participate here in order to avoid the possible bias in results due to practice effects. For the recruitment of children with HFASD, local support groups and organisations were searched through information provided in the Autism directory on the website of NAS in the areas of Scotland and England. These were then contacted through email and/or telephone. Of the 15 groups and organisations contacted, seven agreed to forward the request for participation to families with a child with HFA/AS in their database: The same inclusion and exclusion criteria used in Studies 1, 2 and 3 were used for the additional study (see Section 4.2.1).

Ten children were recruited from these organisations. Eight new non-Hindu typically developing children were recruited through word of mouth at the

researcher's work place. One family in the HFASD group expressed difficulty in continuing participation after the first telephone testing session due to illness of a family member and hence withdrew from the additional study. During the face-to-face testing session, another child in the HFASD group demonstrated difficulties with basic language and communication skills, comprehension of instructions and verbal response to questions. Thus, the child might not have fulfilled all the inclusion criteria for this study and so was not invited for the second telephone testing session.

7.5 Sample

The final sample for this additional study consisted of 16 children comprising eight children with HFASD (8-12 years old) and eight non-Hindu TD children (8-12 years old). This sample size was considered sufficient for correlation as sample size analysis on the GPOWER (Erdfelder, Faul & Buchner, 1996) software showed that an effect size of .8-.9, a p value of .05 and the power of .9 can be achieved by a sample size of 8 for correlation analyses. Data from TD children in the sample were used, both to evaluate correlation between the face-to-face and telephone assessment methods, and also to examine the extent to which the Hindu and non-Hindu children were different in their responses. Data from the HFASD group were used only to evaluate similarity of the face-to-face and telephone assessment methods.

Parents in both the groups were invited to fill in the CAST (Childhood Autism Spectrum Test) scale (Scott et al., 2002) for confirming the presence of symptoms related to autism in children in the HFASD group; and that children in the TD group did not have any clinical level of symptoms related to autism; as indicated by the cut-off score on CAST scale. The vocabulary sub-test of the WISC scale (Wechsler, 2003) was used as a measure of the IQ for children in both the groups since this

vocabulary sub-test has been shown to be highly correlated with the full scale IQ (Groth-Marnat, 2009; also see section 4.6.7) and to establish that children in both the HFASD and the TD group had average or above average IQ; and that there was similarity in the responses of the two groups.

7.6 Procedure

In the face-to-face sessions, parents were present in the same room as the researcher and the child in order to provide necessary support to their child, if required. In the telephone testing sessions too, for the same reason, the parent was in the same room as the child, but in this case the researcher was on telephone. For the telephone administration mode, the instructions for administration of the scales were also provided to parents for any clarification of questions; however, this was not required in any case and the researcher interviewed all children on telephone without parent intervention. In the face-to-face administration, the researcher also directly administered the scales without any parent intervention. The measures specified below were administered twice to all the children, once face-to-face by the researcher and once by telephone. In order to avoid fatigue, order effects and practice effects, a gap of at least three weeks was allowed between the telephone and face-to-face testing modes. Also, the order of mode of testing was varied within both the groups of children to control for order effects. Since the total sample size consisted of eight TD children and eight children with HFASD, four children in each group were randomly chosen and administered scales through face-to-face testing first, followed by telephone testing. The other four children in each group were administered scales by telephone first, followed by face-to-face testing. For face-to-face testing, children were tested in a quiet room in their own homes. For administration by telephone, the

questionnaires were sent by post with a stamped self-addressed envelope. Signed consents on a paper copy were obtained before starting the administration session.

7.7 Measures

As already mentioned, it was not appropriate to re-administer all the measures used in Studies 1, 2 and 3 because of time demands for the participant families. It was decided to administer nine scales to children in this additional study. The selection criteria for these scales were that they should be child-report measures that assessed studies' the key variables of appraisals, negative emotions, anxiety, coping and attributions. Appraisals and negative emotions were investigated twice, once in Study 1 and then again with the improved methodology in Study 2. These two variables were thus assessed in this additional study using the methodology and measures from Study 2 only. Anxiety in Study 1 was assessed using a child- and parent-report version of the SCAS measure. The parent report version was completed by parents independently, not administered by the researcher, so for the purpose of the additional study, only child report version was re-administered. For the same reason, another parent-report measure: the PSC scale, used in Study 2 for the assessment of social difficulties was not included in this additional study.

Two child-report measures, Strange Stories (Happe, 1994) and Birleson Depression Scale (Birleson, 1981), used in Studies 1 and 3 for the investigation of TOM ability and attribution style, respectively, were not administered again in this additional study. The two variables of TOM and depressive symptoms assessed by these two scales have already been extensively researched in the case of children with autism. Inclusion of these two variables in Studies 1 and 3 respectively, was to primarily show their link with the new variables of appraisals and attributions, thus

contextualising this new research into the existing literature. Taking respective time constraints on the participant families into account, it was decided that these scales were relatively less important for re-administration in the additional study and so, were not included. The CAST and vocabulary sub-test of the WISC IV scale were re-administered in this additional study for an investigation of the presence of autism related characteristics and cognitive ability in the HFASD and TD groups; and also to compare the non-standard telephone administration of the WISC sub-test with the standardised face-to-face method. The scales used in this additional study are listed in Table 1 along with a note of which studies they were used in.

Table 1

List of scales used in additional study

Name of measure	Studies it was used in
Narrative Recall	Studies 1 and 2
Appraisal questionnaire (Smith & Lazarus, 1993)	Studies 1 and 2
Emotion questionnaire (Smith & Lazarus, 1993)	Study 2
Perceived control single-item scale	Study 2
KIDCOPE (Spirito, 1988)	Study 2
Spence Children's Anxiety Scale (Spence, 1997)	Study 1
Children's Cognitive Style Questionnaire (Mezulis et al., 2006)	Study 3
Vocabulary sub-test of WISC-IV (Wechsler, 2003)	Studies 1 and 2
CAST (Scott et al., 2002)	Studies 1 and 2

7.8 Results

Data were first tested for age and gender differences between the HFASD and TD groups from the additional study.

7.8.1 Testing for difference in background information between the HFASD and TD groups from the additional study: There were no significant differences between the HFASD and the TD groups for age (HFASD: mean rank= 8.06; TD: mean rank=

6.75; $U = 19.50$, $Z = -.64$, $p = .52$). For gender, chi-square analyses were carried out. There were five boys and three girls in the HFASD group and an equal number of four boys and four girls in the TD group, this difference in the gender of the participants between the HFASD and TD groups was found to be non-significant, χ^2 ($df = 1$) = .25, $p = .61$. The CAST scores of the HFASD (mean rank = 12.50) and the TD groups (mean rank = 4.50) were also compared and no significant differences were found $U = .00$, $Z = -3.38$, $p = .001$. Similarly, the scores on the vocabulary sub-test of the WISC-IV scale for the HFASD (mean rank = 7.19) and the TD groups (mean rank = 9.81) from the additional study were also non-significantly different, $U = 21.50$, $Z = -1.10$, $p = .27$.

7.8.2 Testing for similarities between face-to-face and telephone testing within the HFASD and TD groups from the additional study: Descriptive statistics with mean and S.D. values for the face-to-face and telephone testing modes are shown in Table 2. As can be seen in Table 2, mean scores for the face-to-face and telephone testing modes were similar within the HFASD and TD groups. Data for each of these variables were then tested for the degree of correlation between the face-to-face and telephone testing within the HFASD and the TD groups. Results from correlation analyses are shown in Table 3. Large correlations between the face-to-face and telephone testing modes can be seen, with all but one correlation significant or borderline significant (.06). Correlation coefficients ranged from .66 to .94 for the HFASD group and .68 to .98 for the TD group.

Table 2.

Descriptive Statistics for the face-to-face and telephone testing modes: HFASD and TD

Study	Variables	HFASD Mean (S.D.)		TD Mean (S.D.)	
		face-to-face	telephone	face-to-	telephone
Study1	Self-accountability	1.00 (1.41)	1.25 (1.03)	1.75 (1.28)	1.50 (1.75)
	Future expectancy	1.13 (1.12)	1.00 (1.30)	2.38 (1.59)	2.13 (.99)
	Emotion-focused coping potential	1.13 (1.24)	1.50 (1.31)	4.38 (1.06)	5.00 (1.41)
	Problem-focused coping potential	.75 (1.16)	.50 (.75)	3.38 (.91)	3.00 (.75)
	Fear	1.63 (.74)	2.00 (.73)	1.38 (.51)	1.25 (.46)
	Panic attack and agoraphobia	1.90 (.80)	1.79 (.76)	.96 (.71)	1.09 (.74)
	Separation anxiety	1.67 (.89)	1.54 (.60)	.78 (.69)	.84 (.73)
	Physical injury fears	1.59 (.59)	1.68 (.79)	1.01 (.45)	.88 (.89)
	Social phobia	2.38 (1.01)	2.00 (.94)	1.08 (1.01)	.89 (.74)
	Obsessive-compulsive	2.19 (.70)	2.47 (.89)	.69 (.61)	.87 (.79)
	Generalised anxiety	1.69 (.81)	1.97 (.96)	.76 (.81)	.93 (1.06)
	Vocabulary sub-scale of WISC-IV	11.95 (.56)	12.12 (.78)	11.95 (.56)	12.12 (.78)
Study2	Perceived control	1.02 (.81)	1.26 (.94)	2.23 (.63)	2.42 (.78)
	Sadness	2.00 (.92)	2.50 (.75)	1.40 (.58)	1.29 (.45)
	Guilt	1.63 (.74)	1.50 (.75)	1.36 (.51)	1.20 (.42)
	Approach coping	1.53 (.34)	1.47 (.33)	1.39 (.39)	1.50 (.25)
	Avoidance coping	1.50 (.46)	1.47 (.57)	1.34 (.26)	1.33 (.31)
	Effectiveness of approach coping	1.92 (.25)	1.81 (.41)	1.98 (.56)	2.02 (.63)
	Effectiveness of avoidance coping	1.75 (.47)	.47 (.51)	1.89 (.54)	1.69 (.65)
Study3	Internality attribution	3.06 (1.44)	3.06 (1.78)	1.69 (.91)	1.31 (.49)
	Stability attribution	3.22 (1.14)	2.91 (0.99)	2.25 (1.04)	1.94 (.82)
	Globality attribution	2.75 (1.03)	2.72 (1.08)	1.66 (1.47)	.99 (.79)
	Average attribution	3.01 (1.01)	2.90 (.92)	1.86 (.74)	1.57 (.52)

Table 3.

Correlation and significance between the face-to-face and telephone testing by group

	Variables	HFASD group	TD group
Study1	Self-accountability	$r = .76, p=.02$	$r = .73, p = .03$
	Future expectancy	$r = .75, p=.03$	$r = .68, p = .05$
	Emotion-focused coping potential	$r = .69, p=.05$	$r = .75, p = .03$
	Problem-focused coping potential	$r = .29, p=.47$	$r = .82, p = .01$
	Fear	$r = .76, p=.02$	$r = .74, p = .03$
	Panic attack and agoraphobia	$r = .72, p=.04$	$r = .76, p=.03$
	Separation anxiety	$r = .81, p=.01$	$r = .84, p=.01$
	Physical injury fears	$r = .86, p=.01$	$r = .75, p=.02$
	Social phobia	$r = .70, p=.04$	$r = .73, p=.03$
	Obsessive-compulsive	$r = .81, p=.01$	$r = .78, p=.02$
	Generalised anxiety	$r = .79, p=.02$	$r = .77, p=.02$
	Vocabulary sub-scale of WISC-IV	$r = .76, p=.02$	$r = .98, p< .001$
	Study2	Perceived control	$r = .72, p=.03$
Sadness		$r = .68, p=.06$	$r = .75, p = .03$
Guilt		$r = .72, p=.04$	$r = .73, p = .03$
Approach coping		$r = .83, p=.01$	$r = .72, p = .04$
Avoidance coping		$r = .76, p=.02$	$r = .78, p = .02$
Effectiveness of approach coping		$r = .66, p=.06$	$r = .87, p = .004$
Effectiveness of avoidance coping		$r = .69, p=.05$	$r = .89, p = .003$
Study3	Internality attribution	$r = .76, p=.02$	$r = .87, p = .004$
	Stability attribution	$r = .94, p=.00$	$r = .89, p = .003$
	Globality attribution	$r = .92, p=.00$	$r = .93, p = .001$
	Average attribution score	$r = .76, p=.02$	$r = .90, p = .002$

In the HFASD group, the only correlation that was small and non-significant was for the appraisal dimension of problem-focused coping potential. For the variables of sadness and effectiveness of approach coping, although the correlation coefficients were large (.68 & .66 respectively), p -value (.06) had a borderline significance. This issue is discussed in the Discussion section. In the case of the TD group, all the face-to-face to telephone correlations were large and significant.

Data for all the variables shown in Table 3 were also tested for the significance of differences between the face-to-face and telephone testing modes, within the HFASD and TD groups. The output from Mann Whitney test was found to be non-significant for all the variables, which suggested that there were no significant differences between data collected through telephone or in face-to-face session, for both the HFASD and TD groups.

7.8.3 Testing for differences in background information between the Hindu and non-Hindu children: Next, data were tested for differences between the Hindu and non-Hindu children. Eight TD Hindu children took part in Studies 1 and 2, but only five continued their participation in Study 3. So, the numbers for analyses to assess the significance of difference between the Hindu and non-Hindu TD children, for age and gender varied. Since there were only eight Hindu children in Studies 1 and 2 and five in Study 3 for comparison with eight non-Hindu children from the additional study, for such a small sample size, Mann Whitney *U*-tests were carried out in each case. This non-parametric technique is recommended in the case of small sample sizes (Field, 2006). It should be noted that the same Hindu children who took part in Study 1, continued their participation in Study 2; so, the analyses for significance of differences in age, gender, CAST scores and the vocabulary sub-test scores between the Hindu and non-Hindu children was carried out only once. No significant differences were found for age (non-Hindu: mean rank= 8.43; Hindu: mean rank= 5.33; $U= 11.00$, $Z= -1.49$, $p = .14$) between the Hindu children from Studies 1 and 2 and non-Hindu children from the additional study. Similarly, no significant differences were found between the age of Hindu children from Study 3 (mean rank=

5.13) and non-Hindu children (mean rank= 5.75) from the additional study, $U=10.50$, $Z= -.35$, $p = .73$.

In Studies 1 and 2, out of eight Hindu children, five were girls and three were boys; this difference in gender compared to the non-Hindu TD participants of this additional study was also non-significant, χ^2 (df= 1)= .31, $p = .73$. As mentioned above, only five Hindu children from Studies 1 and 2 continued to take part in Study 3, out of which 3 were girls and 1 was a boy. This difference in gender between the Hindu children from Study 3 and non-Hindu children from the additional study was tested using Fisher's exact test as that is a recommended technique for such small sample sizes (Field, 2006). The difference in gender of the Hindu children from Study 3 and the non-Hindu children from the additional study was also non-significant when tested by Fisher's exact test, $p =.51$.

7.8.4 Testing for differences in data between the Hindu and non-Hindu children:

Data from face-to-face testing for the TD group was also used to compare performance of the Hindu children in the TD group from Studies 1, 2 and 3, and the non-Hindu children from the additional study, to see whether there were significant differences in the performance of these two groups. As explained earlier, since there were only small numbers of Hindu children in each study, Mann Whitney test for two independent groups was carried out for the comparison of the Hindu and non-Hindu children's performance. Descriptive statistics and results from inferential statistics are shown in Table 4, where it can be seen that data for the six appraisal dimensions, fear, six-sub-scales of anxiety, perceived control, coping sub-scales and the vocabulary sub-test of the WISC-IV scale were not significantly different

between the Hindu and non- Hindu children. These findings provide support for the inclusion of Hindu children in the TD group in Studies 1, 2, and 3.

Table 4.

Differences between the Hindu and non-Hindu children in TD group

Study number	Variables	Mean rank		Mann Whitney test output
		Hindu	Non-Hindu	
Study1	Self-accountability	8.19	8.81	$U=29.50, Z=-.27, p=.78$
	Future expectancy	8.10	8.65	$U=26.31, Z=-.27, p=.76$
	Emotion-focused coping potential	8.06	8.94	$U=28.50, Z=-.45, p=.65$
	Problem-focused coping potential	8.13	8.88	$U=29.00, Z=-.35, p=.72$
	Fear	8.50	8.35	$U=32.00, Z=-.09, p=.94$
	Panic attack and agoraphobia	7.94	9.06	$U=27.50, Z=-.48, p=.62$
	Separation anxiety	8.69	8.31	$U=30.50, Z=-.16, p=.87$
	Physical injury fears	8.81	8.19	$U=29.50, Z=-.27, p=.78$
	Social phobia	10.44	6.56	$U=9.00, Z=-1.62, p=.10$
	Obsessive-compulsive	9.50	7.50	$U=24.00, Z=-.89, p=.37$
	Generalised anxiety	8.75	8.25	$U=30.00, Z=-.22, p=.82$
	Vocabulary sub-scale of WISC-IV	8.25	8.75	$U=30.00, Z=-.21, p=.83$
Study2	Perceived control	7.37	7.92	$U=31.00, Z=-.28, p=.79$
	Sadness	8.00	9.00	$U=28.00, Z=-.52, p=.60$
	Guilt	9.50	7.50	$U=24.00, Z=-.97, p=.33$
	Approach coping	9.50	7.50	$U=24.00, Z=-.87, p=.38$
	Avoidance coping	7.19	9.81	$U=21.50, Z=-1.18, p=.24$
	Effectiveness of approach coping	9.69	7.31	$U=22.50, Z=-1.02, p=.31$
Study3	Effectiveness of avoidance coping	9.75	7.25	$U=22.00, Z=-1.07, p=.28$
	Internality attribution	9.20	5.63	$U=9.00, Z=-1.62, p=.10$
	Stability attribution	7.40	6.75	$U=18.00, Z=-.29, p=.77$
	Globality attribution	8.60	6.00	$U=12.00, Z=-1.18, p=.23$
	Average attribution score	8.90	5.81	$U=10.50, Z=-1.39, p=.16$

7.9 Discussion

The findings showed large and significant correlations between the two modes of testing for data collected during the additional study, within the HFASD and TD groups, for the variables of appraisals, negative emotions, anxiety, perceived control, coping, perceived effectiveness of coping and attributions. Significant differences were also found between data from the Hindu children collected during Studies 1, 2 and 3, and the non-Hindu children from the additional study. In the HFASD group, there was a significantly high association between the telephone and face-to-face testing modes for all, but one variable, and borderline significance (.06) for two variables. In the case of the Hindu and non-Hindu children, means for all the variables, were non-significantly different between the two groups. Therefore, it can be argued that data from the telephone testing or due to inclusion of Hindu children in the sample, did not have a biasing effect on the responses of children in either the HFASD or TD groups; except for problem-focused coping potential for which the correlation output was non-significant.

The *p*-value of the correlation coefficient for the variables of sadness and effectiveness of approach coping was .06, in case of the HFASD group. This is borderline significance and in statistical language implies that this finding allows only 6% chance of rejecting a null hypothesis of no difference, when it is actually true. This means there is only a 6% chance of making a Type 1 error (Cohen, 1988, 1992; Murphy & Myers, 1999), which can be considered as acceptable in psychological research with small sample sizes. Furthermore, correlation coefficients for sadness and effectiveness of approach coping were .66 and .68, which suggest strong associations between the face-to-face and telephone testing modes (Bonnett &

Wright, 2000; Greenwald, Gonzales, Harris & Guthrie, 1996; Feldt & Ankenmann, 1999). So, the correlation output for these two variables can be considered to be significant enough to imply that data from the face-to-face and telephone testing modes were similar.

For the appraisal dimension of problem-focused coping potential, correlation coefficient was .29 ($p = .47$). This finding suggests that assessment over telephone might not be a reliable technique for this appraisal dimension. On the other hand, for the other three appraisal dimensions of emotion-focused coping potential, self-accountability and future expectancy, there were significant associations between the two modes of testing. The order of testing for these appraisals was such that the first item related to self-accountability and the last item assessed problem-focused coping potential. It was possible that children with HFASD who are known to have difficulty in sustaining the attention on a task (e.g., Goldstein, Johnson, & Minshew, 2001) were struggling to concentrate by the time the fourth item on the appraisal questionnaire was asked and thus gave incorrect responses.

7.10 Summary

This appendix presented research design, results and discussion of the findings, from the additional study, which demonstrated that there was a strong correlation between face-to-face and telephone testing, except for problem-focused coping potential; and no significant differences between responses of the Hindu and non-Hindu children.

Appendix 8: Interview sheet for narrative recall

Children were told:

“I will ask a number of questions about your past emotional experiences and your responses will be audio and video recorded.”

“Answer the questions as though you are talking to an alien, who though is a brilliant being but has no first-hand experience of the human emotions, and thus eager to learn as much about emotional behaviour as possible. Recall a past experience or event in which you have felt a particular emotion. Also pose the facial expression corresponding to the emotion you experience while imagining the frustrating situation in your mind.”

“I want you to think of a past situation or event where you felt frustrated. Picture this situation in your mind. Try and remember as vividly as you can what this past frustrating situation (*prompt if required) was like: Think of what happened to make you feel frustrated, and what it felt like to be frustrated in this particular situation. Tell me when you are ready and have this frustrating situation in your mind, and I will ask you questions about it. Remember you are telling this to an alien (*prompt if required) who has never had a frustrating experience, what one was like.”

When the subjects say they are ready ask the following series of questions about the experience:

- Please describe this frustrating situation to me.
- What was it like to be frustrated in this situation?

- What happened in this situation to make you feel frustrated?
- Why did these things make you feel frustrated?
- How did you know that you were frustrated in this situation?
- What did it feel like for you to be frustrated in this situation?
- What did you do in this situation where you were frustrated?

Explanation of terms if required:

* **Frustration:** is an emotion we experience when we cannot do something we want to do, it can be due to something inside yourself (e.g. you are not strong enough to do it) or can be due to something external (for e.g. its continuously raining, you want it to stop, but can't because it's not in your control).

***Alien:** someone who is from some other planet and who does not know anything about how humans are.

Appendix 9: Interview sheet for Happe's Strange Stories

The set of stories were introduced as follows:

“Here are some stories, and some questions. I am going to read out the stories and I would like you to listen carefully, and help me with the questions at the end of each story.”

Each story will be read out to the participant except where the participant will prefer to read the story out loud to the experimenter. The story will remain in front of the participant throughout to minimize memory requirements. At the end of the story the participant will be asked the two test questions.

The first question,

“Was it true, what X said?” and will be treated as a test of comprehension.

Record the first answer, but if it is wrong the story should be read out again until the participant answers correctly or justifies their answer and appears to understand.

The second question,

“Why did X say that?” will then be asked, and the subject's answer will be recorded in full on scoring sheets, for later analysis.

Guidelines for the researcher

Positive comments should be made throughout the testing session to encourage the subject, but no feedback should be given about the correctness of the answers.

Prompts should be given only in order to establish sufficient understanding of each story to correctly answer the “Was it true?” question.

1. At school today John was not present. He was away ill. All the rest of John's class were at school, though. When John got home after school his mother asked him, "Was everyone in your class at school today?" John answers, "Yes, Mummy".



Q. Is it true what John said?

Q. Why did John say that?

2. Jimmie and Sarah are best friends. They both entered the same painting competition. Now Jimmie wanted to win this competition very much indeed, but when the results were announced it was his best friend Sarah who won, not him. Jimmie was very sad he had not won, but he was happy for his friend, who got the prize. Jimmie said to Sarah, "Well done, I'm so happy you won!" Jimmie said to his mother, "I'm sad I didn't win that competition!"



Q. Is it true what Jimmie said to Sarah?

Q. Is it true what Jimmie said to his mother?

Q. Why does Jimmie say he is happy and sad at the same time?

3. Sarah and Tom are going on a picnic. It is Tom's idea. He says it is going to be a lovely day for a picnic. But just as they are unpacking the food, it starts to rain, and soon they are both soaked to the skin. Sarah is cross. She says, "Oh yes, a lovely day for a picnic alright!"



Q. Is it true, what Sarah says?

Q. Why does she say that?

4. Allan has a cough. All through lunch he coughs and coughs and coughs. Father says, "Poor Allan, you must have a frog in your throat!"



Q. Is it true, what Father says to Allan?

Q. Why does he say that?

5. Today James is going to Claire's house for the first time. He is going over for tea, and he is looking forward to seeing Claire's dog, which she talks about all the time. James likes dogs very much. When James arrives at Claire's house, Claire runs to open the door, and her dog jumps up to greet James. Claire's dog is huge; it's almost as big as James! When James sees Claire's huge dog he says, "Claire, you haven't got a dog at all. You've got an elephant!"



Q. Is it true, what James says?

Q. Why does James say this?

6. Katie and Marc are playing in the house. Marc picks up a banana from the fruit bowl and holds it up to his ear. He says to Katie, "Look! This banana is a

telephone!"



Q. Is it true what Marc says?

Q. Why does Marc say this?

7. One day, while she is playing in the house, Anna accidentally knocks over her mother's favourite crystal vase. Oh dear, when mother finds out she will be very cross! So when Anna's mother comes home and sees the broken vase and asks Anna what happened, Anna says, "The dog knocked it over, it wasn't my fault!"



Q. Was it true, what Anna told her mother?

Q. Why did she say this?

8. It is Halloween, and Chris is going to a fancy-dress party. He is going as a ghost. He wears a big white sheet with eyes cut out to see through. As he walks to the party in his ghost costume, he bumps into Mr Brown. It is dark, and Mr Brown says, "Oh! Who is it?" Chris answers, "I'm a ghost, Mr Brown!"



Q. Is it true, what Chris says?

Q. Why does Chris say this?

9. Simon is a big liar. Simon's sister Judith knows this; she knows that Simon never tells the truth! Now yesterday Simon stole Judith's ping-pong bat, and Judith knows Simon has hidden it somewhere though she can't find it. She's very cross. So she finds Simon and she says, "Where is my ping-pong bat? You must have hidden it either in the cupboard or under your bed, because I've looked everywhere else. Where is it, in the cupboard or under your bed?" Simon tells her the bat is under his bed.



Q. Was it true, what Simon told Judith?

Q. Where will Judith look for her ping-pong bat?

Q: Why will Judith look in the cupboard for the bat?

10. During the war, the Red army captures a member of the Blue army. They want him to tell them where his army's tanks are; they know they are either by the sea or in the mountains. They know that the prisoner will not want to tell them, he will want to save his army, and so he will certainly lie to them. The prisoner is very brave and very clever; he will not let them find his tanks. The tanks are really in the mountains. Now when the other side ask him where his tanks are, he says, "They are in the mountains".



Q. Is it true what the prisoner said?

Q. Where will the other army look for his tanks?

Q: Why did the prisoner say that?

11. Brian is always hungry. Today at school it is his favourite meal - sausages and beans. He is a very greedy boy, and he would like to have more sausages than anybody else, even though his mother will have made him a lovely meal when he gets home! But everyone is allowed two sausages and no more. When it is Brian's turn to be served, he says, "Oh, please can I have four sausages, because I won't be having any dinner when I get home!"



Q. Is it true, what Brian says?

Q: Why does he say that?

12. Jill wanted to buy a kitten, so she went to see Mrs. Smith, who had lots of kittens she didn't want. Now Mrs. Smith loved the kittens, and she wouldn't do anything to harm them, though she couldn't keep them all herself. When Jill visited she was not sure she wanted one of Mrs. Smith's kittens since they were all males and she had wanted a female. But Mrs. Smith said, "If no one buys the kittens I'll just have to drown them!"



Q. Was it true, what Mrs Smith said?

Q: Why did Mrs. Smith say that?

13. One day Aunt Jane came to visit Peter. Now Peter loves his aunt very much, but today she is wearing a new hat; a new hat, which Peter thinks is very ugly indeed. Peter thinks his aunt looks silly in it and much nicer in her old hat. But when Aunt Jane asks Peter, "How do you like my new hat?" Peter says, "Oh, its very nice".



Q. Was it true what Peter said?

Q: Why does he say that?

14. Helen waited all year for Christmas, because she knew at Christmas she could ask her parents for a rabbit. Helen wanted a rabbit more than anything in the world. At last Christmas Day arrived, and Helen ran to unwrap the big box her parents had given her. She felt sure it would contain a little rabbit in a cage. But when she opened it, with the entire family standing round, she found her present was just a boring old set of encyclopaedias, which Helen did not want at all! Still, when Helen's parents asked her how she liked her Christmas present, she said, "It's lovely, thank you. It's just what I wanted".



Q: Is it true, what Helen said?

Q: Why did she say this?

15. Late one night old Mrs. Peabody is walking home. She doesn't like walking home alone in the dark because she is always afraid that someone will attack her and rob her. She really is a very nervous person! Suddenly, out of the shadows comes a man. He wants to ask Mrs. Peabody what time it is, so he walks towards her. When Mrs. Peabody sees the man coming towards her, she starts to tremble and says, "Take my purse, and just don't hurt me please!"



Q: Was the man surprised at what Mrs. Peabody said.

Q: Why did she say that, when he only wanted to ask her the time?

16. A burglar who has just robbed a shop is making his getaway. As he is running home, a policeman on his booth sees him drop his glove. He doesn't know the man is a burglar; he just wants to tell him he dropped his glove. But when the policeman shouts out to the burglar, "Hey, you! Stop!". The burglar turns round, sees the policeman and gives himself up. He puts his hands up and admits that he did the break-in at the local shop.



Q: Was the policeman surprised by what the burglar did?

Q: Why did the burglar do this, when the policeman just wanted to give him back his glove?

17. Daniel and Ian see Mrs Thompson coming out of the hairdresser's one day. She looks a bit funny because the hairdresser has cut her hair much too short. Daniel says to Ian, "She must have been in a fight with a lawnmower!"



Q: Is it true, what Daniel says?

Q: Why does he say this?

18. On Christmas Eve Alice's mother takes her to the big department store in town. They go to look in the toy department. In the toy department Mr. Brown, Alice's next-door neighbour, is dressed up as Santa Claus, giving out sweets to all the children. Alice thinks she recognises Mr. Brown, so she runs up to him and asks, "Who are you?" Mr. Brown answers, "I'm Santa Claus!"



Q: Is it true what Mr. Brown says?

Q: Why does he say this?

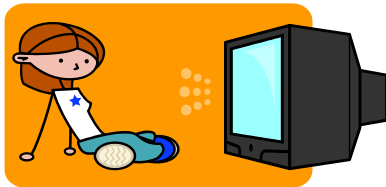
19. William is a very untidy boy. One day his mother comes into his bedroom, and it is even more messy than usual! There are clothes, toys, and comics everywhere. William's mother says to William, "This room is a pig sty!"



Q: Is it true that William keeps pigs in his room?

Q: Why does William's mother say this?

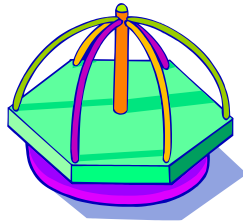
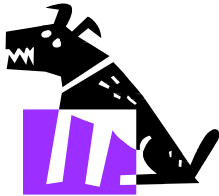
20. Ann's mother has spent a long time cooking Ann's favourite meal; fish and chips. But when she brings it in to Ann, she is watching TV, and she doesn't even look up, or say thank you. Ann's mother is cross and says, "Well that's very nice, isn't it! That's what I call politeness!"



Q: Is it true, what Ann's mother says?

Q: Why does Ann's mother say this?

21. Today, Katy wants to go on the swings in the playground. But to get to the playground she knows she has to pass old Mr. Jones' house. Mr. Jones has a nasty fierce dog, and every time Katy walks past the house the dog jumps up at the gate and barks. It scares Katy awfully, and she hates walking past the house because of the nasty dog. But Katy does so want to play on the swings. Katy's mother asks her, "Do you want to go out too the playground?" Katy says, "No"



Q: Is it true what Katy says?

Q: Why does she say she doesn't want to go to the playground, when she So wants to go on the swings that are there?

22. Yvonne is playing in the garden with her doll. She leaves her doll in the garden when her mother calls her in for lunch. While they are having lunch, it starts to rain. Yvonne's mother asks Yvonne, "Did you leave your doll in the garden?" Yvonne says, "No, I brought her in with me, mummy".



Q: Is it true, what Yvonne says?

Q: Why does Yvonne say this?

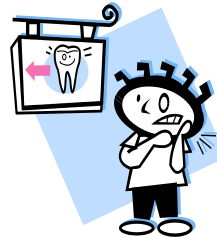
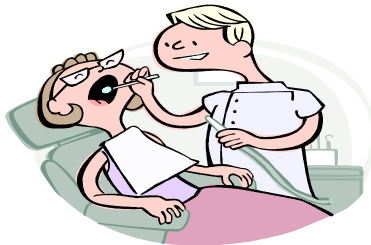
23. Mark and Adam are having great fun! They have turned the kitchen table upside down and they are sitting in it, paddling along with rolled up newspapers. When their mother comes in she laughs. “Whatever are you two doing?”, she asks. “This table is a pirate ship”, says Adam, “And you had better get in too before you sink – because you are standing in the sea!”



Q: Is it true what Adam says?

Q: Why does he say this?

24. John hates going to the dentist, because every time he does to the dentist he needs a filling, and that hurts a lot. But John knows that when he has toothache, his mother always takes him to the dentist. Now John has bad toothache at the moment, but when his mother notices he is looking ill and asks him, “Do you have tooth-ache, John?”, John says, “No, Mummy”.



Q: Is it true, what John says to his mother?

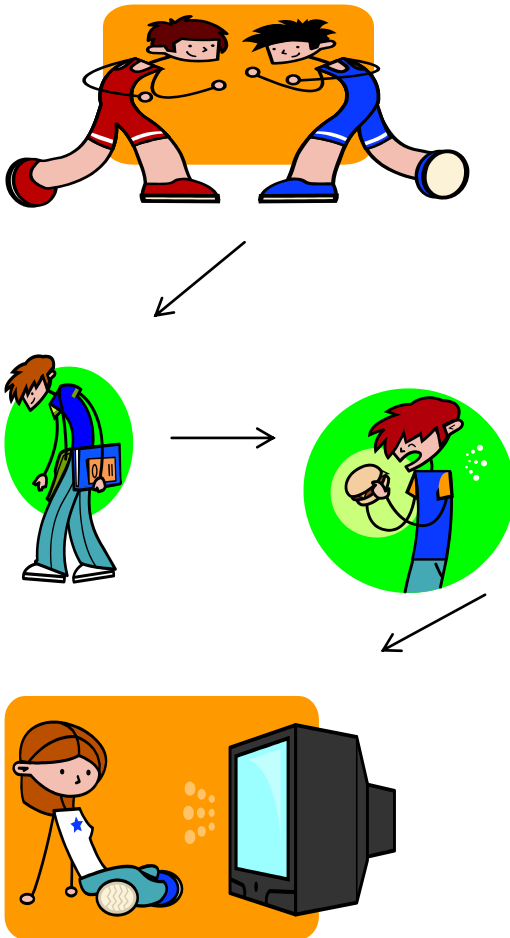
Q: Why does John say this?

Appendix 10: Hypothetical Frustrating Vignette

Situation 1

Stage 1

You have had a long day at school. You had an argument with your friend and come back home late really fed-up. You plan to relax by watching TV. You change your clothes, get a burger from the kitchen and walk towards the living room to watch TV. You get to the living room and find your big sister already watching a DVD. You just hate the movie she is watching and don't want to watch it just now. Your sister notices you standing there and she tells you to leave the room and not disturb her.



Stage 2

Both versions

You tell your sister that you had a very tiring and difficult day at school. You have homework to do. You ask her to let you watch cartoons a bit and to watch her DVD later. But your sister refuses.

Version 1

You can't believe that your sister can be so insensitive and rude. You really want to see some cartoons and have explained her that you had a tiring day still she doesn't care. You are just asking her to let you watch TV for few minutes. Why can't she be a bit more reasonable? You feel that she has no right to boss you like this, as it's your home as well.

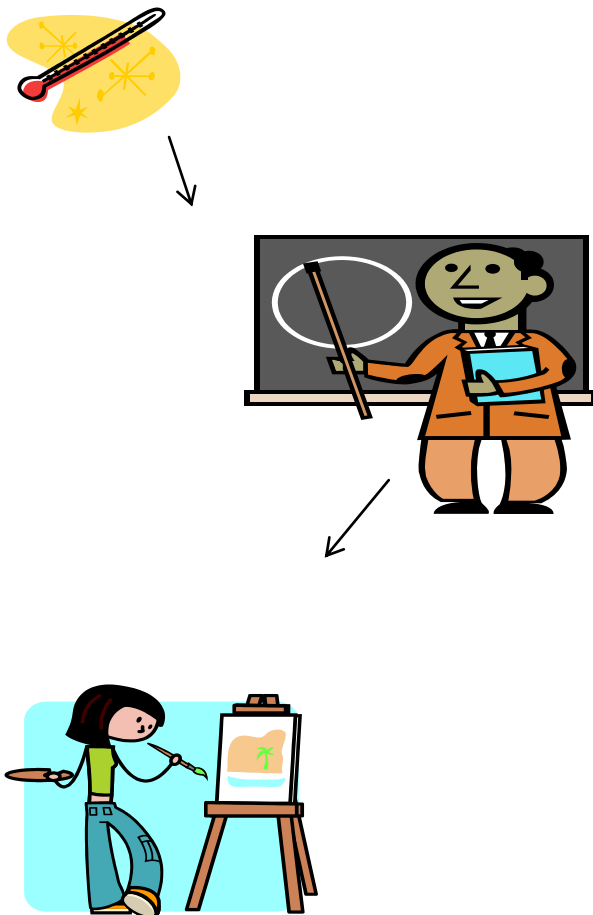
Version 2

You realize that everything this morning has going wrong. You want to change the channel but don't know how your sister will react (*preparing to retreat*). You don't get along very well with her. You are worried that she might get upset with you if start an argument with her (*preparing to retreat*). Now you are wondering what other bad thing is going to happen today and how will you cope.

Situation 2

Stage 1

In an art class teacher ask everyone to draw a sketch for the main board. She said that the best ones will be displayed on the parents' day. You draw the sketch of countryside with motorway on one side, railway line on the other, and also show some grazing cattle. You generally get highest score in arts class. You are quite happy with your work and go and show it to the teacher. The teacher, however, asks you to draw a shop as well. "I don't see any shop near countryside" you reply. She insists that you draw it. You refuse as it won't be a proper sketch of countryside then. She tells you that if you don't draw shops, she will not display your sketch on parents' day.



Stage 2

Both versions

You try to explain her once again and say “I want the sketch to look like this; shop will not look good here”. The teacher is very cross. You tell her that asked everyone to draw a sketch of their own choice. The teacher gets very angry and tells you that your sketch is not chosen for the parents’ day.

Version 1

This time you are really upset, and you don’t understand why she is behaving like this. She asked everyone to draw a sketch of their own choice and that’s what you did. You know how countryside view is, and it doesn’t have a shop (*preparing to advance*). Then what is her problem, why is she insisting on drawing a shop. How and for what reasons can she refuse to display your sketch for parents’ day (*preparing to advance*)?

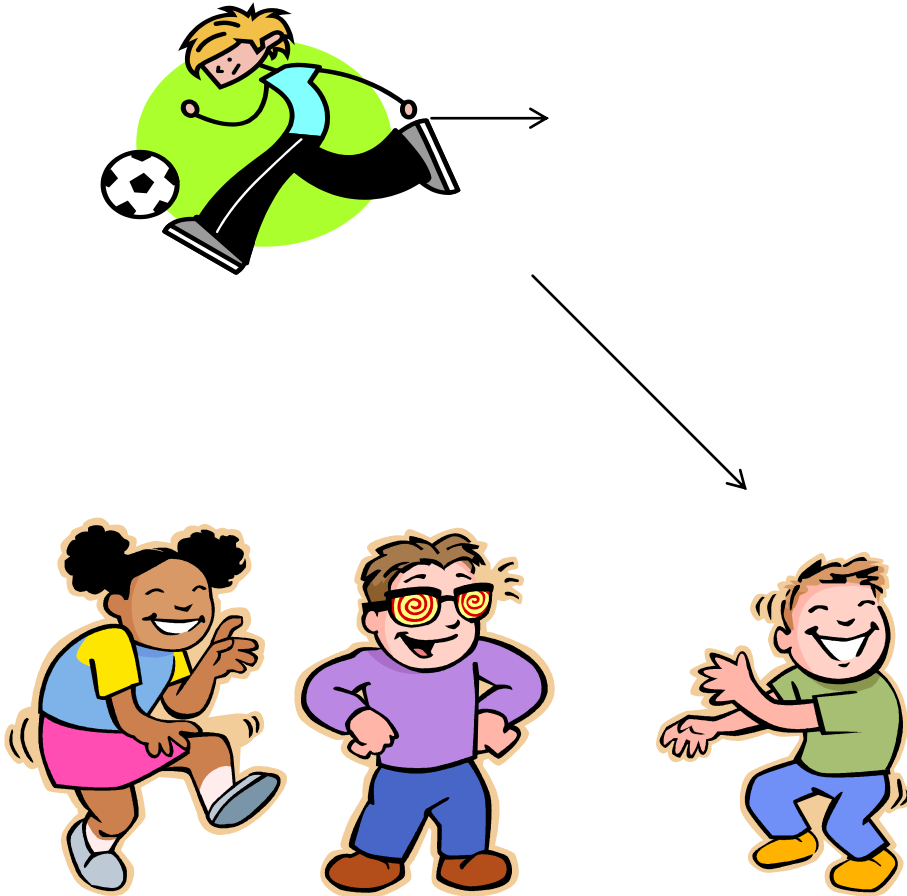
Version 2

This time you realize that you have been wrong in not following her instructions. You should have drawn a shop when she was insisting. Now you wonder what else will she do (*preparing to retreat*)? She might complain against you to your parents or the school principal. What if other students of the class get to know that you argued with her and didn’t follow her instructions (*preparing to retreat*)?

Situation 3

Stage 1

You are in the playground of your school. You are playing football with a friend. Few other students from your class are also standing adjacent to the ground. Every time you make a mistake they laugh at you and call you a 'failure'. You are trying even harder to play well. Because of that you are not able to concentrate on the game. You are getting conscious of your performance. You suddenly trip and fall down.



Stage 2

You realize that you have badly injured your knee. It's hurting you a lot. The group of other children again starts laughing at you.

Version 1

You think to yourself how can they can be so insensitive and rude (*preparing to advance*). Who are they to comment on your game? They know you are hurt and still they are laughing. It's not the first time they have made fun of you. You decide that you cannot allow them to laugh at you anymore (*preparing to advance*).

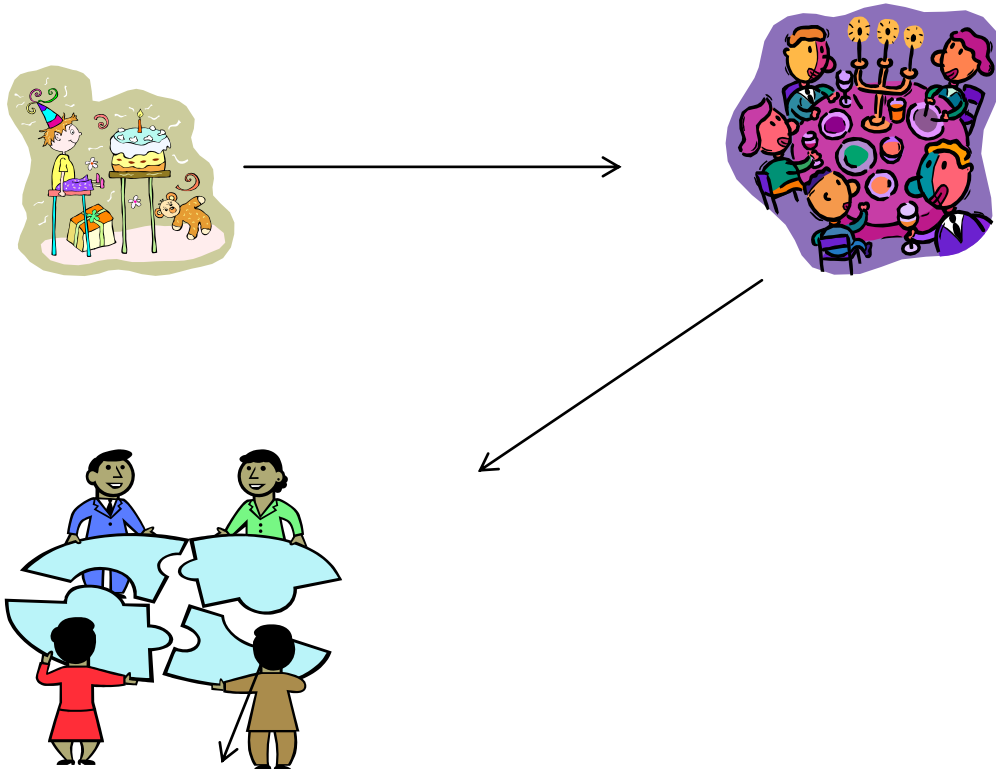
Version 2

You think that you are not a good football player. Why do you even try to play football when you can't (*preparing to retreat*). Now you wonder if they will go and tell everyone else about this. You are worried about facing this group again in class (*preparing to retreat*). You feel you made a fool out of yourself.

Situation 4

Stage 1

You are at your cousin's birthday party. You and your cousin are at the same school but have different friends. Your cousin has invited all his school friends to the party. You don't get along very well with them. Your cousin and his friends are playing a game and he asks you to join in. You go and ask them what they are playing. Your brother tells you the rules but you don't understand and ask him to explain it again. At this moment, one of your brother's friends laughs at you. He says that you shouldn't be a part of the game as you cannot even understand a simple rule.



Stage 2

Your cousin tells you the rules of the game once again. But, you still don't understand particularly as your cousin's friend was laughing and you couldn't hear your cousin properly.

Version 1

You are not sure if you should tell your cousin again that you still haven't understood the rules of the game. You look at his friend who is still looking at you and laughing. You want him to go away so that your cousin can explain the rules once again (*preparing to advance*). Your cousin now asks you if you have understood the rules (*preparing to advance*).

Version 2

You don't understand your cousin's friend's behaviour (*preparing to retreat*). He always interferes between you and your cousin. He is always horrible to you and it's because of him that you couldn't understand what your cousin told you. You look at him and find that he is still laughing. You wonder what else he might do (*preparing to retreat*).

Appendix 11: Questionnaire to measure appraisal dimensions

Below are a number of questions about your thoughts in the situation you just imagined. For each question please answer with a number from 0 to 11 to indicate what you were thinking in this situation during the time you just imagined.

1-----2-----3-----4-----5-----6-----7-----8-----9-----10-----11
not at all moderately extremely much

- 1) How important was what was happening in this situation to you?_____
- 2) Did you dislike being in this situation, if yes to what extent??_____
- 3) Did you like being in this situation, if yes to what extent?_____
- 4) To what extent did you consider YOURSELF responsible for this situation?_____
- 5) To what extent did you consider SOMEONE ELSE responsible for this situation?_____
- 6) To what extent did you think the situation will turn out as you wish it to?_____

Instruction: For the following questions specific endpoints are provided to help you define the scale for that question. Please give your answer according to the endpoints provided here.

- 7) How certain were you that you would be able to change things to make (or keep) the situation pleasant? (0 = completely certain WOULD NOT be able; 2 = completely uncertain; 4 completely certain that I WOULD be able). _____
- 8) How certain were you that you would, be able to deal emotionally with this situation? (0 = completely certain WOULD NOT be able; 4 = completely uncertain; 6 = completely certain WOULD be able). _____

Appendix 12: Fear Questionnaire

Below are a number of words (with pictures) that describe different synonyms for emotions of fear. Please indicate the extent to which each word (or picture) describes the way you felt within the situation you just imagined/described. Please record your answer for each word by circling the number on the eleven point scale that best describes what you were feeling, where:

1-----2-----3-----4-----5-----6-----7-----8-----9-----10-----11

not at all

moderately

extremely much



Frightened 0 1 2 3 4



Scared 0 1 2 3 4



Afraid 0 1 2 3 4

Appendix 13: Spence Children's Anxiety Scale- child version

Instructions: Please put a circle around the word that shows how often each of these things happen to you. There are no right or wrong answers.

1. I worry about things	Never	Sometimes	Often	Always
2. I am scared of the dark	Never	Sometimes	Often	Always
3. When I have a problem, I get a funny feeling in my stomach	Never	Sometimes	Often	Always
4. I feel afraid	Never	Sometimes	Often	Always
5. I would feel afraid of being on my own at home	Never	Sometimes	Often	Always
6. I feel scared when I have to take a test	Never	Sometimes	Often	Always
7. I feel afraid if I have to use public toilets or bathrooms	Never	Sometimes	Often	Always
8. I worry about being away from my parents	Never	Sometimes	Often	Always
9. I feel afraid that I will make a fool of myself in front of people	Never	Sometimes	Often	Always
10. I worry that I will do badly at my school work	Never	Sometimes	Often	Always
11. I am popular amongst other kids my own age	Never	Sometimes	Often	Always
12. I worry that something awful will happen to someone in my family	Never	Sometimes	Often	Always
13. I suddenly feel as if I can't breathe when there is no reason for this	Never	Sometimes	Often	Always
14. I have to keep checking that I have done things right (like the switch is off, or the door is locked)	Never	Sometimes	Often	Always
15. I feel scared if I have to sleep on my own	Never	Sometimes	Often	Always
16. I have trouble going to school in the mornings because I feel nervous or afraid	Never	Sometimes	Often	Always
17. I am good at sports	Never	Sometimes	Often	Always
18. I am scared of dogs	Never	Sometimes	Often	Always
19. I can't seem to get bad or silly thoughts out of my head	Never	Sometimes	Often	Always
20. When I have a problem, my heart beats really fast	Never	Sometimes	Often	Always
21. I suddenly start to tremble or shake when there is no reason for this	Never	Sometimes	Often	Always
22. I worry that something bad will happen to me	Never	Sometimes	Often	Always

23. I am scared of going to the doctors or dentists	Never	Sometimes	Often	Always
24. When I have a problem, I feel shaky	Never	Sometimes	Often	Always
25. I am scared of being in high places or lifts (elevators)	Never	Sometimes	Often	Always
26. I am a good person	Never	Sometimes	Often	Always
27. I have to think of special thoughts to stop bad things from happening (like numbers or words)	Never	Sometimes	Often	Always
28. I feel scared if I have to travel in the car, or on a Bus or a train	Never	Sometimes	Often	Always
29. I worry what other people think of me	Never	Sometimes	Often	Always
30. I am afraid of being in crowded places (like shopping centres, the movies, buses, busy playgrounds)	Never	Sometimes	Often	Always
31. I feel happy	Never	Sometimes	Often	Always
32. All of a sudden I feel really scared for no reason at all	Never	Sometimes	Often	Always
33. I am scared of insects or spiders	Never	Sometimes	Often	Always
34. I suddenly become dizzy or faint when there is no reason for this	Never	Sometimes	Often	Always
35. I feel afraid if I have to talk in front of my class	Never	Sometimes	Often	Always
36. My heart suddenly starts to beat too quickly for no reason	Never	Sometimes	Often	Always
37. I worry that I will suddenly get a scared feeling when there is nothing to be afraid of	Never	Sometimes	Often	Always
38. I like myself	Never	Sometimes	Often	Always
39. I am afraid of being in small closed places, like tunnels or small rooms		YES		NO
40. I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order)	Never	Sometimes	Often	Always
41. I get bothered by bad or silly thoughts or pictures in my mind	Never	Sometimes	Often	Always
42. I have to do some things in just the right way to stop bad things happening	Never	Sometimes	Often	Always
43. I am proud of my school work	Never	Sometimes	Often	Always
44. I would feel scared if I had to stay away from home overnight	Never	Sometimes	Often	Always
45. Is there something else that you are really afraid of?		YES		NO
Please write down what it is _____				

Spence Children's Anxiety Scale- parent version

Instructions: Below is a list of items that describe children. For each item please circle the response that best describes your child. Please answer all items.

1. My child worries about things	Never	Sometimes	Often	Always
2. My child is scared of the dark	Never	Sometimes	Often	Always
3. When my child has a problem, s(he) complains of having a funny feeling in his / her stomach	Never	Sometimes	Often	Always
4. My child complains of feeling afraid	Never	Sometimes	Often	Always
5. My child would feel afraid of being on his/her own at home	Never	Sometimes	Often	Always
6. My child is scared when s(he) has to take a test	Never	Sometimes	Often	Always
7. My child is afraid when (s)he has to use public toilets or bathrooms	Never	Sometimes	Often	Always
8. My child worries about being away from us / me	Never	Sometimes	Often	Always
9. My child feels afraid that (s)he will make a fool of him/herself in front of people	Never	Sometimes	Often	Always
10. My child worries that (s)he will do badly at school	Never	Sometimes	Often	Always
11. My child worries that something awful will happen to someone in our family	Never	Sometimes	Often	Always
12. My child complains of suddenly feeling as if (s)he can't breathe when there is no reason for this	Never	Sometimes	Often	Always
13. My child has to keep checking that (s)he has done things right (like the switch is off, or the door is locked)	Never	Sometimes	Often	Always
14. My child is scared if (s)he has to sleep on his/her own	Never	Sometimes	Often	Always
15. My child has trouble going to school in the mornings because (s)he feels nervous or afraid	Never	Sometimes	Often	Always
16. My child is scared of dogs	Never	Sometimes	Often	Always
17. My child can't seem to get bad or silly thoughts out of his / her head	Never	Sometimes	Often	Always
18. When my child has a problem, s(he) complains of his/her heart beating really fast	Never	Sometimes	Often	Always
19. My child suddenly starts to tremble or shake when there is no reason for this	Never	Sometimes	Often	Always
20. My child worries that something bad will happen to him/her	Never	Sometimes	Often	Always
21. My child is scared of going to the doctor or dentist	Never	Sometimes	Often	Always
22. When my child has a problem, (s)he feels shaky	Never	Sometimes	Often	Always
23. My child is scared of heights (eg. being at the top of a cliff)	Never	Sometimes	Often	Always
24. My child has to think special thoughts (like numbers or words) to stop bad things from happening	Never	Sometimes	Often	Always

25. My child feels scared if (s)he has to travel in the car, or on a bus or train	Never	Sometimes	Often	Always
26. My child worries what other people think of him/her	Never	Sometimes	Often	Always
27. My child is afraid of being in crowded places (like shopping centres, the movies, buses, busy playgrounds)	Never	Sometimes	Often	Always
28 All of a sudden my child feels really scared for no reason at all	Never	Sometimes	Often	Always
29. My child is scared of insects or spiders	Never	Sometimes	Often	Always
30. My child complains of suddenly becoming dizzy or faint when there is no reason for this	Never	Sometimes	Often	Always
31. My child feels afraid when (s)he has to talk in front of the class	Never	Sometimes	Often	Always
32. My child's complains of his / her heart suddenly starting to beat too quickly for no reason	Never	Sometimes	Often	Always
33. My child worries that (s)he will suddenly get a scared feeling when there is nothing to be afraid of	Never	Sometimes	Often	Always
34. My child is afraid of being in small closed places, like tunnels or small rooms	Never	Sometimes	Often	Always
35. My child has to do some things over and over again (like washing his / her hands, cleaning or putting things in a certain order)	Never	Sometimes	Often	Always
36. My child gets bothered by bad or silly thoughts or pictures in his/her head	Never	Sometimes	Often	Always
37. My child has to do certain things in just the right way to stop bad things from happening	Never	Sometimes	Often	Always
38. My child would feel scared if (s)he had to stay away from home overnight	Never	Sometimes	Often	Always
39. Is there anything else that your child is really afraid of?		YES		NO
Please write down what it is _____				

Also fill out how often (s)he is afraid of this thing: Never Sometimes Often Always

Appendix 14: Vocabulary sub-test of the WISC-IV scale

Instructions as provided in the administration manual of the WISC-IV scale (Wechsler, 2004) were followed for administration.

Age (years)	Item	Response	Score		
6-8	Hat		1	2	3
	Umbrella		1	2	3
9-11	Clock		1	2	3
	Cow		1	2	3
12-16	Thief		1	2	3
	Bicycle		1	2	3
	Alphabet		1	2	3
	Leave*		1	2	3
	Ancient		1	2	3
	Pest		1	2	3
	Brave		1	2	3
	Obey		1	2	3
	Island		1	2	3
	Nonsense		1	2	3
	Transparent		1	2	3
	Precise*		1	2	3
	Mimic		1	2	3
	Fable		1	2	3
	Migrate		1	2	3
	Rivalry		1	2	3
	Foresight		1	2	3
	Seldom		1	2	3
	Strenuous		1	2	3
	Unanimous		1	2	3
Imminent*		1	2	3	
Amendment		1	2	3	
Compel		1	2	3	
Affliction*		1	2	3	
Garrulous		1	2	3	
Dilatory		1	2	3	
Aberration		1	2	3	

*Responses required specific query, indicated in the administration manual of WISC-IV scale

(Wechsler, 2004).

Appendix 15: Childhood Asperger Syndrome Test (CAST)

To be filled by parents

Child's Name:..... Age: Sex: Male / Female

Birth Order: Twin or Single Birth:

Parent/Guardian:

Parent(s) occupation:

Age parent(s) left full-time education:

Address:

.....
.....

Tel.No: School:

**Please read the following questions carefully, and circle the appropriate answer.
All responses are confidential.**

Does s/he join in playing games with other children easily?	Yes	No
Does s/he come up to you spontaneously for a chat?	Yes	No
Was s/he speaking by 2 years old?	Yes	No
Does s/he enjoy sports?	Yes	No
Is it important to him/her to fit in with the peer group?	Yes	No
Does s/he appear to notice unusual details that others miss?	Yes	No
Does s/he tend to take things literally?	Yes	No
When s/he was 3 years old, did s/he spend a lot of time pretending (e.g., play-acting being a superhero, or holding teddy's tea parties)	Yes	No
Does s/he like to do things over and over again, in the same way all the time?	Yes	No
Does s/he find it easy to interact with other children?	Yes	No
Can s/he keep a two-way conversation going?	Yes	No
Can s/he read appropriately for his/her age?	Yes	No
Does s/he mostly have the same interests as his/her peers?	Yes	No
Does s/he have an interest, which takes up so much time that s/he does little else? Does s/he have friends, rather than just acquaintances?	Yes	No
Does s/he often bring you things s/he is interested in to show you?	Yes	No
Does s/he enjoy joking around?	Yes	No

Does s/he have difficulty understanding the rules for polite behaviour?	Yes	No
Does s/he appear to have an unusual memory for details?	Yes	No
Is his/her voice unusual (e.g., overly adult, flat, or very monotonous)?	Yes	No
Are people important to him/her?	Yes	No
Can s/he dress him/herself?	Yes	No
Is s/he good at turn-taking in conversation?	Yes	No
Does s/he play imaginatively with other children, and engage in role-play?	Yes	No
Does s/he often do or say things that are tactless or socially inappropriately?	Yes	No
Can s/he count to 50 without leaving out any numbers?	Yes	No
Does s/he make normal eye-contact?	Yes	No
Does s/he have any unusual and repetitive movements?	Yes	No
Is his/her social behaviour very one-sided and always on his/her own terms?	Yes	No
Does s/he sometimes say "you" or "s/he" when s/he means "I"?	Yes	No
Does s/he prefer imaginative activities such as play-acting or story-telling, rather than numbers or lists of facts?	Yes	No
Does s/he sometimes lose the listener because of not explaining what s/he is talking about?	Yes	No
Can s/he ride a bicycle (even if with stabilisers)?	Yes	No
Does s/he try to impose routines on him/her, or on others, in such a way that it causes problems?	Yes	No
Does s/he care how s/he is perceived by the rest of the group?	Yes	No
Does s/he often turn conversations to his/her favourite subject rather than following what the other person wants to talk about?	Yes	No
Does s/he have odd or unusual phrases?	Yes	No
Does s/he care how s/he is perceived by the rest of the group?	Yes	No
Have teachers/health visitors ever expressed any concerns about his/her development	Yes	No
If yes, please specify _____		
Has s/he ever been diagnosed with any of the following?		
Language delay	Yes	No
Hyperactivity/Attention Deficit Disorder (ADHD)	Yes	No
Hearing or visual difficulties	Yes	No
Autism Spectrum Condition, incl. Asperger's Syndrome	Yes	No
A physical disability	Yes	No
Other (please specify) _____		

Appendix 16: Sheet A Summary of Results of Study 1 for parents of child with HFASD

Dear Parent,

Thank you very much for participating in my PhD study. I am pleased to say that I have now completed study-1. I hope you don't mind my coming back to you with another request for your help. I need to do a follow-up study for reconfirming the diagnosis of Asperger Syndrome in your child. For this purpose, you are invited to fill in a simple questionnaire about the social and communication abilities of your child and this should not take more than 10 minutes of your time. I will be grateful if you can fill in the enclosed questionnaire titled CAST- Childhood Asperger Syndrome Test and send it back in the enclosed stamped self-addressed envelope as soon as possible (latest by 1st October 2008). I must emphasize that in order to make the results from study-1 more valid for future intervention plans and disseminate it to clinicians and teachers; completion of this scale is important. I hope you will be able to spare 10 minutes from your busy schedule for filling CAST.

Study-1 has pointed up some areas for further study in order to help improve social functioning in children with Asperger Syndrome (AS). I have included some of my preliminary findings below. Study 1 suggests that:

- Children with Asperger Syndrome have theory-of-mind deficits- difficulty in understanding perspective of another person in a social interaction.
- These theory-of-mind deficits may cause impairment in appraisal dimensions in children with Asperger Syndrome This means those children with AS have some difficulty evaluating a situation as either harmful or beneficial. This difficulty consisted of:
 1. Higher self-blame in AS children in frustrating situations compared to the typically developing (TD) group in the study
 2. Children with AS showed low confidence in their own ability to deal emotionally with frustrating situations compared to the TD group.
 3. Scores of children with AS were lower on the appraisal of future outcomes or how to change a current situation to make it better for their future goals.

Furthermore, the findings showed:

- There was a higher prevalence of anxiety disorders such as panic attack and agoraphobia, separation anxiety and social phobia were found in the Asperger group as compared to the TD category.
- Results also indicated more frequent use of avoidance coping strategies as compared to the TD children. Avoidance coping strategies were found to be positively correlated with anxiety and mood disorders in AS group and are known to be ineffective strategy to manage stress.

As discussed in this sheet, Study-1 has highlighted specific deficits in thought processes and coping strategies in children with Asperger Syndrome, which might impair their ability to form meaningful social relationships. In order to form firmer conclusions about how children with Asperger Syndrome evaluate potential harm or benefit in a given situation, how they cope with it and what effect impairment in these have on social adjustment, I need a larger sample of children with Asperger Syndrome. Thus, I am now inviting you to take part in study-2 of my PhD.

Please note that you can either choose to participate in just the follow-up study and fill in CAST or volunteer your full participation for study-2. If you are interested to take part in Study 2, please read the enclosed information sheet.

Many thanks,

Shilpi Gupta.

Appendix 17: Participant Information Sheet for parents of child with HFASD- new families

Dear Parent,

I am a PhD student under the supervision of Dr Lisa Woolfson, Reader in Psychology, carrying out research into which thoughts cause the negative emotions (e.g. guilt, sadness, anger and fear) and how children with Asperger Syndrome cope with these emotions. I need to recruit a group of children with Asperger Syndrome aged 8-12 years to fill in some questionnaires. The results are intended to help parents, caregivers and other professionals help children with Asperger Syndrome to cope better with daily life challenges. Results will be made available to you shortly after the completion date of September 2009.

You will be asked to interview your child about his/her past emotional experiences of any one of these four emotions: guilt, sadness, anger and fear. Your child will then be invited to fill in simple questionnaires about his/her thoughts and feelings in that situation, and you will be requested to read the instructions of each questionnaire to your child. This will not take more than 30 minutes. I will also call you at a convenient time and have a brief 5-10min phone interview with your child to carry out a small word test and I am also happy to be on phone to clear doubts, if any while you and your child are filling in questionnaires, if you wish.

Your child will be asked to explain the meanings of some common words. You too will be invited to fill in two questionnaires, one designed to reconfirm the diagnosis of Asperger Syndrome and the other to study social adjustment and mood in your child. This will take around 15 minutes of your time. The study will be conducted online and the questionnaires can be completed at any time depending on what suits you best.

All data collected will be treated with strictest confidence, will be stored in locked cabinets within the University and destroyed after the study is complete. The study has been approved by University of Strathclyde Ethics Committee.

If you choose to participate, you will automatically be entered in a prize draw to win a **deluxe foot spa** and the name of winner will be announced in the month of June 2009.

I would also be happy to give you a copy of summary of results from Study 1, which has revealed some trends in the thought patterns and coping strategies of children with Asperger Syndrome, and of course my hearty thanks.

Even after you agree to take part if you then change your mind later, you can stop at any time for any reason. If you are willing to take part, please fill in the enclosed questionnaires and send them back in the enclosed self-addressed envelope. Alternatively, you can log on to the link provided in your email and submit your responses online.

If you have any questions please contact me at the Dept. of Psychology on tel: 0141 548 2873 or email: shilpi.gupta@strath.ac.uk.

Thank you,

Shilpi Gupta

Appendix 18: Parent Information Sheet parents of child with TD

Dear Parent,

Thank you very much for participating in my PhD study. I am pleased to say that I have now completed study-1 and this has pointed up some areas for further study in order to help improve social functioning in children with Asperger Syndrome (AS).

Next, I need to do a follow-up study just for investigating the nature of social-emotional development in your child, which will be compared to responses of parents of AS group to reconfirm the diagnosis of AS in them. For this purpose, you are invited to fill in a simple questionnaire about the social and communication abilities of your child and this should not take more than 10 minutes of your time. I will be grateful if you can fill in the enclosed questionnaire titled CAST- Childhood Asperger Syndrome Test and send back in the stamped self-addressed envelope. I must emphasize that in order to make the results from study-1 valid and disseminate it to clinicians and teachers; completion of this scale is very essential. I hope you will be able to spare 10 minutes from your busy schedule for filling CAST.

Study 2

I am now also inviting you to take part in study 2 of my PhD. Please note that you can either choose to participate in just the follow-up study and fill in CAST only or volunteer your full participation for Study 2. Study 2 will investigate which thoughts cause the negative emotions (e.g. guilt, sadness, anger and fear) and how children cope with these emotions. Results will be made available to you shortly after the completion date of September 2009.

You will be asked to interview your child about his/her past emotional experiences of any one of these four emotions: guilt, sadness, anger and fear. Your child will then be invited to fill in simple questionnaires about his/her thoughts and feelings in that situation. This will not take more than 30 minutes. I will also call you at a convenient time and have a brief 5-10min phone interview with your child to carry out a small word test and I will also be available on phone to clear doubts, if any while you and your child are filling in questionnaires, if you wish. Your child will be asked to explain the meanings of some common words.

You too will be invited to fill in two questionnaires, one designed to reconfirm the diagnosis of Asperger Syndrome and the other to study social adjustment and mood in your child. This will take around 15 minutes of your time. The study will be conducted

online and the questionnaires can be completed at any time depending on what suits you best.

All data collected will be treated with strictest confidence, will be stored in locked cabinets within the University and destroyed after the study is complete. The study has been approved by University of Strathclyde Ethics Committee. If you choose to participate, you will automatically be entered in a prize draw to win a **deluxe foot spa** and the name of winner will be announced in the month of June 2009.

Even after you agree to take part if you then change your mind later, you can stop at any time for any reason. If you are willing to take part, please, complete the enclosed questionnaires and send back in the stamped self-addressed envelope. Alternatively, you can log on to the link provided in your email and submit your responses online. If you have any questions please contact me at the Dept. of Psychology on tel: 0141 548 2873 or email: shilpi.gupta@strath.ac.uk.

In case you choose not to participate further in any capacity, I will take this opportunity to thank you for your very valuable participation.

Many Thanks,

Shilpi Gupta

Appendix 19: Information sheet for children

Hello,



My name is Shilpi Gupta and currently I am a PhD student in the Department of Psychology, University of Strathclyde. I have done my masters in child psychology; have worked with children of different ages and abilities and now, I am carrying out research to better understand the mood and negative emotions (e.g. fear and sadness) in children like you, under the supervision of Dr Lisa Woolfson, Reader, Department of Psychology, University of Strathclyde.



What is this research about?



I am interested to find out the reasons why children like you feel these emotions and how can we make the experience of such emotions less upsetting.



What is the purpose of this research?



Almost everyone experiences negative emotions and mood, and if not managed properly, these can cause difficulties. Thus, it becomes crucial to investigate the best ways of dealing with negative emotions so that we can reduce



their frequency in daily life and feel happier.



How many children in total will I include in my study?



I need a total of 100 children aged 8-12 years old (girls or boys).



What will I be expected to do if I agree to take part in this study and how long will it take?



One of your parents will ask you questions about your past experiences of any one of these four emotions: guilt, sadness, anger and fear. You will fill in some simple questionnaires about your thoughts and feelings in those situations

and how you dealt with them. This will not take more than 30 minutes. I

will also call you at convenient time for a brief 5-10 min phone

interview, and carry out a quick word test where you will be asked to explain meanings of some common words. Your parent too will be invited to fill in

two questionnaires, which will not take more than 15-20 minutes of their time.



What is the duration of study?



The study will be complete by September 2009 and the results will be made available to you within a month from the date of completion.



Are there any incentives from the study?



If you choose to participate, you will automatically be entered in a prize draw to win a **deluxe foot spa** and the name of winner will be announced in the month of June '09.

Where will



the research be carried out?



The study will be available online and can be completed from your home at any time, depending on what suits you best. If you are willing to participate, you just need to log on to the link given in your parent's sheet with one of your parents and submit your responses online. I will also call you at a convenient time to carry out a quick word test.



Before you decide about whether you want to take part in my study or not, I will also like to inform you about your rights:



o You do not need to take part in this study, if you don't want to. Even



if you agree to take part and then change your mind later, you can stop at any time for any reason.



- o Things you write on the questionnaire will go in a report .
- o Nothing you say will have your or your parents' name on it.
- o All the responses online will be password secure and no one other than I and my



supervisor can see them. If you have any questions or are worried about anything I am asking or am doing, please feel free to contact me at the Dept of



Psychology on tel: 0141 548 2873 or



email: shilpi.gupta@strath.ac.uk.

Thank you

Shilpi Gupta

Appendix 20: Interview sheet for narrative recall

For parents (in case, help required): Read out the following instructions to your child, exactly as they are given. Please note that no help should be given to the child about either the situation or how he/she felt in the situation recalled. The instructions can be repeated again if the child fails to understand the first time. Give maximum of 5 minutes for recalling the following situation.

Instructions: “I want you to think of a past situation or event, which was unpleasant yet important to you. Picture this situation in your mind. Try and remember as vividly as you can what this past situation was like: Think of what happened to make it appear unpleasant, and what it felt like to be in this particular situation. Tell me when you are ready and have this situation in your mind, and I will ask you questions about it. “When the child says they are ready ask the following series of questions about the experience:

- Please describe this situation to me.
- What was it like to be in this situation?
- What happened in this situation to make you it unpleasant yet important to you?

Appendix 21: Appraisal questionnaire

Below are a number of questions about your thoughts in the situation you just imagined. For each question please answer with a number from 0 to 4 to indicate what you were thinking in this situation during the time you just imagined.

Scale: 0- not at all; 1- a little; 2- somewhat; 3- a lot; 4- extremely

- 1) To what extent did you consider YOURSELF responsible for this situation? _____
- 2) To what extent did you consider SOMEONE ELSE responsible for this situation? _____
- 3) To what extent did you think the situation will turn out as you wish it to?

Instruction: For the following questions specific endpoints are provided to help you define the scale for that question. Please give your answer according to the endpoints provided here.

- 4) How certain were you that you would be able to change things to make (or keep) the situation pleasant? (0 = completely certain WOULD NOT be able; 2 = completely uncertain; 4 completely certain that I WOULD be able). _____
- 5) How certain were you that you would, be able to deal emotionally with this situation? (0 = completely certain WOULD NOT be able; 4 = completely uncertain; 6 = completely certain WOULD be able).

Appendix 22: Emotion Rating Form

For parents (in case, help required): Please read out the following instructions to your child. This is a self-report scale and should be completed by the child only, no suggestions should be given. However, you are allowed to read the questions to your child. After reading each question (exactly the way it is given here), please wait for your child to respond. You can repeat each question twice. If the child fails to give an answer even after repeating the question twice, leave it blank and move to the second question.

For children: Below are a number of words that describe different emotions or feelings. Please indicate the extent to which each word describes the way you felt within the situation you described. Please record your answer for each word by circling the number on the three point scale that best describes what you were feeling, where "1" indicates "not at all", "2" somewhat, "3" indicates "extremely."

Angry	1	2	3
Sad	1	2	3
Guilty	1	2	3
Fearful	1	2	3

Adapted from Smith & Lazarus, 1993

Appendix 23: KIDCOPE

Instructions

For parents (in case, help required): Please read out the following instructions to your child. Please note, that this is self-report questionnaire and should be completed by the child only, no suggestions should be given. However, you are allowed to read the questions to your child. After reading each question (exactly the way it is given here), please wait for your child to respond. You can repeat each question twice. If the child fails to give an answer even after repeating the question twice, leave it blank and move to the second question.

For children: Below are a number of questions about how did you cope with situation you just described. For each question first answer on a 2-point scale of ‘yes’ or ‘no’ to indicate whether you used that specific coping strategy or not. Then, respond on a 3-point scale (not at all, a little, a lot) to express how helpful was that coping strategy.

Scale:

	Did you do this?		How much did it help?		
	Yes	No	Not at all	a little	a lot
I just tried to forget it	Yes	No	Not at all	a little	a lot
I did something like watch TV or played a game to forget it	Yes	No	Not at all	a little	a lot
I stayed by myself	Yes	No	Not at all	a little	a lot
I kept quiet about the problem	Yes	No	Not at all	a little	a lot
I tried to see the good side of things	Yes	No	Not at all	a little	a lot
I blamed myself for causing the problem.	Yes	No	Not at all	a little	a lot
I blamed someone else for causing the problem	Yes	No	Not at all	a little	a lot

	Did you do this?		How much did it help?		
	Yes	No	Not at all	a little	a lot
I tried to fix the problem by thinking of answers	Yes	No	Not at all	a little	a lot
I tried to fix the problem by doing something or talking to someone.	Yes	No	Not at all	a little	a lot
I yelled, screamed, or got mad	Yes	No	Not at all	a little	a lot
I tried to calm myself down	Yes	No	Not at all	a little	a lot
I wished the problem had never happened	Yes	No	Not at all	a little	a lot
I wished I could make things different	Yes	No	Not at all	a little	a lot
I tried to feel better by spending time with others like family, grownups, or friends	Yes	No	Not at all	a little	a lot
I didn't do anything because the problem couldn't be fixed	Yes	No	Not at all	a little	a lot

Appendix 24: Paediatric Symptoms Checklist

Instructions: Emotional and physical health go together in children. Because parents are often the first to notice a problem with their child's behavior, emotions, or learning, you may help your child get the best care possible by answering these questions. Please indicate which statement best describes your child.

	Never	Sometimes	Often
1. Complains of aches and pains	_____	_____	_____
2. Spends more time alone	_____	_____	_____
3. Tires easily, has little energy	_____	_____	_____
4. Fidgety, unable to sit still	_____	_____	_____
5. Has trouble with teacher	_____	_____	_____
6. Less interested in school	_____	_____	_____
7. Acts as if driven by a motor	_____	_____	_____
8. Daydreams too much	_____	_____	_____
9. Distracted easily	_____	_____	_____
10. Is afraid of new situations	_____	_____	_____
11. Feels sad, unhappy	_____	_____	_____
12. Is irritable, angry	_____	_____	_____
13. Feels hopeless	_____	_____	_____
14. Has trouble concentrating	_____	_____	_____
15. Less interested in friends	_____	_____	_____
16. Fights with other children	_____	_____	_____
17. Absent from school	_____	_____	_____
18. School grades dropping	_____	_____	_____
19. Is down on him or herself	_____	_____	_____
20. Visits the doctor with doctor finding nothing wrong	_____	_____	_____
21. Has trouble sleeping	_____	_____	_____
22. Worries a lot	_____	_____	_____
23. Wants to be with you more than before	_____	_____	_____
24. Feels he or she is bad	_____	_____	_____
25. Takes unnecessary risks	_____	_____	_____
26. Gets hurt frequently	_____	_____	_____
27. Seems to be having less fun	_____	_____	_____
28. Acts younger than children his or her age	_____	_____	_____
29. Does not listen to rules	_____	_____	_____
30. Does not show feelings	_____	_____	_____
31. Does not understand other people's feelings	_____	_____	_____
32. Teases others	_____	_____	_____
33. Blames others for his or her troubles	_____	_____	_____
34. Takes things that do not belong to him or her	_____	_____	_____
35. Refuses to share	_____	_____	_____
Total score _____			

Does your child have any emotional or behavioral problems for which she or he needs help? () N () Y

Are there any services that you would like your child to receive for these problems?
() N () Y

Appendix 25: Participant Information Sheet- Parent of child with HFASD

Dear Parent,

Many thanks for taking part in Study 1 and Study 2 of my PhD study. You already know the results of Study 1. Study 2 data collection is still in progress and will also be made available once the study is complete in March 2009. I hope you don't mind my coming back to you with another request. I am now recruiting for the third and final study of my PhD. This aims to look at longer term effects of thinking style on personality traits and social adjustment in children with Asperger Syndrome. I need to recruit children with Asperger Syndrome who have already taken part in Study 1 and Study 2 to fill in simple questionnaires. The results are intended to help parents, caregivers and other professionals help children with Asperger Syndrome to cope better with daily life challenges. Results will be made available to you shortly after the completion date of September 2009.

If you agree to take part, your child will be asked to fill in a short self-report questionnaire about how his/her mood and behaviour during the past week. Another questionnaire will ask your child to imagine being in school based social situations and choose one answer about his/her thoughts in each situation. You will be requested to be with your child while s/he is answering the questionnaires. The whole study will not take more than 15-20 minutes. The whole study can be completed online and at any time from your home depending on what suits you best.

All data collected will be treated with strictest confidence, will be stored in locked cabinets within the University and destroyed after the study is complete. The study has been approved by University of Strathclyde Ethics Committee.

Even after you agree to take part if you then change your mind later, you can stop at any time for any reason. If you are willing to take part, please log on to the following link (scales will be uploaded after gaining ethics approval) complete the questionnaires and submit your responses online. If you have any questions please contact me at the Dept. of Psychology on tel: 0141 548 2007 or email: shilpi.gupta@strath.ac.uk or my supervisor Dr Lisa Woolfson at email: lisa.woolfson@strath.ac.uk or tel: 01415482580.

Thank you,

Shilpi Gupta

Appendix 26: Participant Information Sheet- Parent of TD child

Dear Parent,

Many thanks for taking part in Study 1 and Study 2 of my PhD study. You already know the results of Study 1. Study 2 data collection is still in progress and will also be made available once the study is complete in March 2009. I hope you don't mind my coming back to you with another request. I am now recruiting for the third and final study of my PhD. This aims to look at longer term effects of thinking style on personality traits and social adjustment in children with Asperger Syndrome. I need to recruit a group of typically developing children who have already taken part in Study 1 and Study 2 to fill in simple questionnaires, so that I can compare their responses to those of children with Asperger Syndrome. The results are intended to help parents, caregivers and other professionals help children with Asperger Syndrome to cope better with daily life challenges. Results will be made available to you shortly after the completion date of September 2009.

If you agree to take part, your child will be asked to fill in a short self-report questionnaire about how his/her mood and behaviour during the past week. Another questionnaire will ask your child to imagine being in school based social situations and choose one answer about his/her thoughts in each situation. You will be requested to be with your child while s/he is answering the questionnaires. The whole study will not take more than 15-20 minutes. The whole study can be completed online and at any time from your home depending on what suits you best.

All data collected will be treated with strictest confidence, will be stored in locked cabinets within the University and destroyed after the study is complete. The study has been approved by University of Strathclyde Ethics Committee.

Even after you agree to take part if you then change your mind later, you can stop at any time for any reason. If you are willing to take part, please log on to the following link (scales will be uploaded after gaining ethics approval) complete the questionnaires and submit your responses online. If you have any questions please contact me at the Dept. of Psychology on tel: 0141 548 2007 or email: shilpi.gupta@strath.ac.uk or my supervisor Dr Lisa Woolfson at email: lisa.woolfson@strath.ac.uk or tel: 01415482580.

Thank you,

Shilpi Gupta

Appendix 27: Information sheet for children

Hi,

My name is Shilpi Gupta and currently I am a PhD student in the Department of Psychology, University of Strathclyde. I hope you remember me from last year when you with your parent took part in my research study. Many thanks for all your help in my study. I am carrying out research to better understand the effect of negative thoughts on emotions. I am working under the supervision of Dr Lisa Woolfson, Reader, Department of Psychology, University of Strathclyde.



What is this research about?

I am interested to find out the reasons why children feel these emotions and how can we make the experience of such feelings less upsetting.




How many children in total will I include in my study?

I need a total of 32 children aged 8-12 years old (girls or boys).



What will I be expected to do if I agree to take part in this study and how long will it take?

You will be invited to imagine being in a school situation and to choose one of a few options in a questionnaire about your thoughts and feelings in that situation. You will also be asked to mark on a scale how your behaviour and mood was in the past week.

This will not take more than  20 minutes.





Where will the research be carried out?




The study will be available online and can be completed from your home at any time, depending on what suits you best. If you are willing to participate, you just need to log on to the link given in your parent's sheet with one of your parents and submit your responses online.





Before you decide about whether you want to take part in my study or not, you should know that:

o You do not need to take part in this study,  if you don't want to. Even if you agree to take part and then change your mind later, you can stop  at any time for any reason.

o Things you write on the questionnaire will go in a report  but nothing you say will have your or your parents' name on it.

o All the responses online will be password secure and no one other than I and my supervisor can see them

o If you have any questions  or are worried about anything I am asking or am

doing, please feel free to contact me at the Dept of Psychology on  tel: 0141

548 2007 or  email: shilpi.gupta@strath.ac.uk or my supervisor Dr Lisa

Woolfson at  email: lisa.woolfson@strath.ac.uk or on  tel: 01415482580.

Thank you

Shilpi Gupta

Appendix 28: Children's Cognitive Style Questionnaire (CCSQ)

Instructions: Read each of the following six situations (A-F) carefully. Imagine being in each situation. Then read all the five options provided after each situation. Think about how you would think if you were in that situation. Then choose on a scale of 0 to 5 for each of the five options that best describes your thinking in that situation.

Key: 0 – strongly disagree , 1 – disagree, 2 - not sure, 3- somewhat agree/may be, 4- agree, 5- strongly agree

A. Imagine you did really badly on a maths test at school.

1. If I did badly on a maths test, it was probably because I'm not very clever.
2. If I did badly on a maths test, it was probably because I always do bad at maths.
3. If I did badly on a maths test, it was probably because everything at school was hard that day.
4. If I did badly on a maths test, it means there is something wrong with me.
5. If I did badly on a maths test, other bad things will probably happen to me.

B. Imagine some children at school were playing a game but wouldn't let you join in.

1. If the children wouldn't let me play with them, it was probably because I did something to make them not want to play with me that day.
2. If the children wouldn't let me play with them, it was probably because they are never nice to me.
3. If the children wouldn't let me play with them, it was probably because I'm not good at most games.
4. If the children wouldn't let me play with them, it means there is something wrong with me.

5. If the children wouldn't let me play with them, other bad things will probably happen to me.

C. Imagine you did really well on a science project at school.

1. If I did well on my science project, it was probably because I'm good at science.
2. If I did well on my science project, it was probably because I always do well at school.
3. If I did well on my science project, it was probably because the teacher liked everyone's projects that time.
4. If I did well on my science project, it means I am a good person.
5. If I did well on my science project, other good things will probably happen to me.

D. Imagine your best friend wouldn't talk to you one day.

1. If my friend wouldn't talk to me, it was probably because I did something to make my friend upset with me.
2. If my friend wouldn't talk to me, it was probably because my friend is the kind of person who gets upset a lot.
3. If my friend wouldn't talk to me, it was probably because I am not a nice person in general.
4. If my friend wouldn't talk to me, it means there is something wrong with me.
5. If my friend wouldn't talk to me, other bad things will probably happen to me.

E. Imagine you had to read a story in class and answer questions about it, but you got most of the answers wrong.

1. If I got the answers wrong, it was probably because I was not good at reading that day.
2. If I got the answers wrong, it was probably because I always do poorly at school.
3. If I got the answers wrong, it was probably because all the work the teacher gives is too hard.

4. If I got the answers wrong, it means there is something wrong with me.
 5. If I got the answers wrong, other bad things will probably happen to me.
- F. Imagine you were invited to a party by a child at school who you really like.
1. If I was invited to a party, it was probably because I did something nice for the child recently.
 2. If I was invited to a party, it was probably because the child always invites me to his/her parties.
 3. If I was invited to a party, it was probably because I'm a good fun in general.
 4. If I was invited to a party, it means I am a good person.
 5. If I was invited to a party, other good things will probably happen to me.

Appendix 29: Birleson Self-report Scale

Instructions: Please state 'y' in the column beside each of the sentences which best describes how you have felt over the past week. Please answer as honestly as you can. There are no right or wrong answers, it is important to say how you have felt *over the past week*. Thank you.

	Most	Sometimes	Never
I look forward to things as much as I used to			
I sleep very well			
I feel like crying			
I like to go out			
I get tummy aches			
I enjoy my food			
I can stick up for myself			
I am good at things I do			
I enjoy the things I do as much as I used to			
I like talking with my family			
I have horrible dreams			
I feel very lonely			
I am easily cheered up			
I feel very bored			