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VOLUME I

SOCIAL COMMUNICATION DEFICITS AND CONDUCT DISORDER

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D.Clin.Psy 2006

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Overview

This thesis proposes the presence of undetected social communication deficits of an autistic type in a small proportion of children with conduct problems. Part I reviews the literature on conduct disordered children, advancing this argument through: critical examination of the diagnostic classification systems; reinterpretation of the behavioural markers associated with Conduct Disorder; and examination of sample definition in research.

Part II is a report of an empirical study testing the hypotheses that excluded and at-risk-of-exclusion primary school children have social communication difficulties of an autistic type, in line with pragmatic deficits identified in this population (Gilmour, Hill, Place & Skuse, 2004). The hypotheses were supported, showing significantly more excluded than comparison children scoring in the clinical range on the Children's Communication Checklist (Bishop, 1998) and on the Developmental Dimensional and Diagnostic Interview (Skuse et al., 2004). A significant proportion of excluded children met criteria for a Pervasive Developmental Disorder and a Conduct Disorder (International Classification of Diseases - 10; World Health Organisation, 1993). None of the comparison children met criteria for either diagnoses. These findings support the assertion that social communication deficits are undetected in children with conduct problems. Findings are discussed in terms of clinical and research implications.

Part III is a critical appraisal of the thesis. Further methodological and theoretical issues are considered. This is followed by a personal reflection and a final summary of the thesis.

*Abbreviations**Diagnostic terms*

DSM	Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association
DSM-III-R	The third revised edition (1987) of the DSM
DSM-IV	The fourth (1994) edition of the DSM
ICD	International Classification of Diseases: Classification of Mental and Behaviour Disorders, World Health Organisation
ICD-10	The (1993) edition of ICD
ADHD	Attention Deficit Hyperactivity Disorder (DSM)
ASD	Non diagnostic term for Pervasive Developmental Disorder, used here to refer to Autistic Disorder /Childhood Autism, Asperger's Disorder / Syndrome, Atypical Autism and Pervasive Developmental Disorder Not Otherwise Specified / Unspecified
CD	Conduct Disorder
ODD	Oppositional Defiant Disorder
PDD	Pervasive Developmental Disorder, refers to the entire spectrum of disorders with autistic symptomatology
PDD-NOS	Pervasive Developmental Disorder: Not Otherwise Specified (DSM)
PDD unspecified	Pervasive Developmental Disorder: unspecified (ICD)

Measures

ADI-R	Autism Diagnostic Interview – Revised (Lord, Rutter & Le Couteur, 1994)
ADOS	Autism Diagnostic Observation Schedule (Lord et al., 1989)
CCC	Children’s Communication Checklist (Bishop, 1998)
3di	Developmental, Dimensional and Diagnostic Interview (Skuse et al., 2004)

Organisations

APA	American Psychiatric Association
DfSE	Department for Skills and Education, UK
NAS	National Autistic Society, UK
WHO	World Health Organisation

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PART I

REVIEW PAPER

CONDUCT PROBLEMS IN CHILDREN: A CASE FOR UNDETECTED AUTISTIC SPECTRUM DISORDER

1.0. Abstract

There is increasing evidence that a proportion of children with Conduct Disorder may have unidentified Autistic Spectrum Disorder (Gilchrist et al., 2001; Gilmour, Hill, Place & Skuse, 2004). This paper considers the argument that a subgroup of children with Autistic Spectrum Disorder are undetected and subsumed under Conduct Disorder or similar descriptors. Diagnostic criteria are described and issues relevant to Conduct Disorder discussed. This is followed by an examination of the similarities and differences between Autistic Spectrum Disorder and Conduct Disorder. The case for misclassification of Autistic Spectrum Disorder is explored through reinterpretation of the behavioural markers associated with Conduct Disorder. Sample definition in studies of children with Conduct Disorder is then critically examined. The paper concludes with a review of the literature on social information processing in children with Conduct Disorder exploring whether some findings could be better explained by an Autistic Spectrum Disorder presentation.

2.0. Introduction

2.1. Overview

Evidence of previously unidentified Autistic Spectrum Disorder (ASD) in children with Conduct Disorder (CD) is starting to emerge (e.g., Gilmour et al., 2004). This raises the possibility of misclassification of ASD in research and in clinical practice. This paper proposes that a significant minority of children with ASD are undetected and subsumed under CD or similar descriptors. This argument is advanced through critical examination of the diagnostic classification systems. Comparative studies inform the argument for misclassification of ASD as CD raising important issues of symptom overlap and comorbidity. This is followed by a reinterpretation of the behavioural markers associated with CD with reference to the autistic triad of impairment. Sample definition in studies of children with CD is then critically examined highlighting potential ways in which ASD may be misclassified. Finally, a review of social information processing research into CD concludes that some findings may be better explained by an ASD presentation.

2.2. Setting the Scene

Whilst the debate around the diagnostic parameters of ASD is acknowledged, (e.g., Dossetor, 2005), this is beyond the scope of the present review. Similarly the complex phenomenological debates around comorbidity in child and adolescent psychiatry are not discussed (see Angold, Costello & Erkanli, 1999 for further discussion). Primary diagnosis is used to refer to the main diagnosis. Diagnostic criteria are described for the purposes of exploring the argument for the misclassification of ASD. The following databases are consulted: PsychInfo;

Medline and the International Bibliography of Social Sciences. Key words for searching include *oppositional defiant disorder, conduct disorder, disruptive behaviour disorder, conduct problems, behaviour problems, antisocial behaviour, externalising disorders, aggression, hard to manage, offender, delinquent, school exclusion, autism, Asperger's, autistic spectrum, social communication, language and social information processing*. Both text word searches and indexed terms are used with appropriate truncation and masking. Whilst no restricted dates are used, priority was given to studies published in the last ten years, in addition to seminal papers.

3.0. Diagnostic Classification Systems

3.1. Pervasive Developmental Disorders

Given the focus of this paper, the diagnostic criteria are examined in some detail.

“Pervasive developmental disorders are characterised by severe and persistent impairment in several areas of development: reciprocal social interaction skills, communication skills, or the presence of stereotyped behaviour, interests, and activities” (Diagnostic and Statistical Manual of Mental Disorders [DSM-IV]: American Psychological Association [APA], 1994, p. 69). It is required that these are discrepant to the child’s developmental age.

Further detail on this triad of impairment is relevant given symptom overlap with CD. Social interaction impairments include problems in establishing peer relations and difficulties adapting behaviour to fit the social context. Communication skills may be impaired so that the child displays a lack of emotional response to others’ verbal and non-verbal communication. The child may also show marked difficulty in both initiating and sustaining conversation. Examples of stereotypy can include non-functional routines and restricted patterns of interests.

This triad of impairment is present in Autistic Disorder (DSM-IV: APA, 1994) or Childhood Autism (International Classification of Diseases [ICD-10]: World Health Organisation [WHO], 1993) and in Asperger’s Disorder (DSM-IV) or Asperger’s Syndrome (ICD-10). The main difference is that children described as having the latter diagnoses show no clinically significant delays or deviance in language acquisition or cognitive development. However, there is increasing evidence that

there is no meaningful difference in middle childhood and beyond (e.g., Szatmari, Bryson, Boyle, Streiner & Duku, 2003). The Pervasive Developmental Disorders (PDDs) of interest to this paper are: Autistic Disorder or Childhood Autism; Asperger's Disorder or Syndrome; Atypical Autism; and PDD-Not Otherwise Specified (PDD-NOS) or PDD unspecified.

PDD-NOS (DSM-IV: APA, 1994) or PDD unspecified (ICD-10: WHO, 1993) are categorisations used to describe children who have general difficulties pertaining to the triad of impairment, but fail to meet diagnostic criteria for a specific PDD. Atypical Autism (DSM-IV: APA, 1994; ICD-10: WHO, 1993) is used to describe those who do not meet the diagnostic criteria for Autistic Disorder or Childhood Autism due to late age of onset, atypical or sub threshold symptomatology. Community samples may include children who fit these categories where autistic traits adversely impact on educational and social development. PDDs are often referred to as ASD (Wing 1988). ASD is behaviourally defined with multiple aetiologies including strong genetic component (e.g., Tanguay, Robertson & Derrick, 1998). For the purposes of this paper the term ASD is used in its broad sense. Further differentiation will be made only when relevant to the discussion.

3.2. Disruptive Behaviour Disorders

CD is characterised by “a repetitive and persistent pattern of behaviour in which the basic rights of others or major age-appropriate societal norms or rules are violated” (DSM-IV, 1994, p. 93). It is subtyped according to age of onset and may also be described in terms of severity. Three or more behaviours from a list of fifteen behaviours categorised under the subheadings: aggression to people and animals;

destruction of property; deceitfulness or theft; and serious rule violations must be present in the past 12 months, with at least one criterion present in the past six months in order to meet diagnosis.

The ICD-10 (WHO, 1993) criteria are more descriptive taking greater account of contextual factors. This classification system also recognises that conduct disordered behaviour may be symptomatic of other conditions. ICD-10 describes similar behaviours to DSM-IV (APA, 1994) specifying that the presence of any one is sufficient for diagnosis provided it is persistent and present for at least six months. CD confined to the family context describes interactions with members of the family or immediate household. In contrast, unsocialised CD describes persistent dissocial or aggressive behaviour with atypical peer relationships. Lastly, socialised CD describes children who are well integrated into a peer group where the behaviours of concern often occur outside the family context.

The other disruptive behaviour disorder is Oppositional Defiant Disorder (ODD) which describes negative, defiant, disobedient and hostile behaviour towards people in authority lasting at least six months (DSM-IV: APA, 1994). Eight behaviours are listed of which four or more are required to be present for diagnosis. Similarly ICD-10 (WHO, 1993) describes ODD as defiant, disobedient or provocative behaviour without any dissocial or aggressive acts violating the law and others' rights. The case for misclassification of ASD is most plausible for unsocialised CD and ODD.

Children presenting with clinical levels of impairment who do not meet diagnostic criteria are classified as having Disruptive Behaviour Disorder NOS (DSM-IV:

APA., 1994) or as having Conduct Disorders Unspecified (ICD-10: WHO, 1993). With regard to exclusion criteria and differential diagnosis it is noteworthy that ICD-10 mentions PDD as an exclusion criterion for CD, whereas DSM-IV (APA., 1994) does not.

For the purposes of this paper CD is used in its broad sense. Misclassification and under-detection may also apply to children who are not psychiatrically defined i.e., community samples with significant levels of social impairment. Terms used to describe such children include *hard-to-manage*, *offender* and *delinquent*. Children excluded from school constitute another community defined group. The most common reasons cited for school exclusion are persistent disruptive behaviour, physical aggression, verbal abuse, and refusal to comply with rules (Department for Skills & Education, 2001; Ripley & Yuill, 2005). These behaviours constitute conduct problems that may reach thresholds for diagnosis of ODD or CD.

3.2.1. Long-term outcomes associated with CD

Ten percent of children between the ages of 5 and 15 years have a mental disorder of which 5% have a CD, 4% emotional disorders and 1% hyperkinetic disorders (Office of National Statistics, 1999). CD is the most common psychiatric disorder in childhood, and the most frequently cited reason for referral to child and adolescent mental health services (Office for National Statistics, 2000). Conduct problems are associated with poor educational attainment and peer rejection. Furthermore, those with CD are at high risk for criminality, personality disorders and substance abuse in adulthood (Kazdin, 1995; Rutter, 2004). CD is also associated with considerable public expenditure in various domains including mental and general health, social

services and the juvenile justice system (Bagley & Pritchard, 1998; Foster & Jones, 2005). This troubling trajectory is described by Moffitt and Caspi (2001) as “life-course persistent CD”. The cost associated with CD in the UK for 10 year old children followed up at aged 28 years is 10 times higher than that for comparison children, exceeding £70, 000 per child (Scott, Knapp, Henderson & Maughan, 2001). This figure is contrasted with £23,324 for children with conduct problems. Antisocial behaviour at aged 10 years is a powerful predictor of public expenditure at aged 28 years, even after poor reading and low family socio-economic status are controlled (Scott, et al., 2001).

3.2.2. Methodological and diagnostic issues relevant to CD

This section aims to highlight methodological and diagnostic issues that make misclassification of ASD as CD possible. Methodological and taxonomic difficulties of CD include unreliability of diagnostic methods, single informant bias and threshold for diagnosis (Werry, 1997).

There is some debate as to the usefulness of age subtyping in CD. Sanford et al. (1999) find that multi-informant retrospective reports on age of onset do not improve predictive validity of future behaviour in clinical populations. Furthermore, adolescent limited and life course persistent CD show comparable levels of antisocial behaviour and arrest during adolescence (Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). However support for the discriminant validity of age of onset suggests the need for further research (Vermeiren, 2003).

A more recent distinction has been made between reactive and proactive antisocial behaviours (e.g., Kempes, Matthys, de Vries & van Engeland, 2005). Reactive aggression is defined as a response to a perceived threat or provocation. This can be a defensive response, and may be accompanied by feelings of anger (Crick & Dodge, 1996). Conversely, proactive or instrumental aggression describes behaviour that is motivated by achieving some external goal or reward. These premeditated, unprovoked behaviours are not usually associated with anger or frustration (Dodge & Coie, 1987). The case for undetected ASD is strongest for childhood onset CD and for reactive aggression. Indeed, negative peer evaluation of a child with ASD may lead to the child being bullied, which could trigger reactive aggression (Tsatsanis, Foley & Donehower, 2004).

The co-occurrence of CD with Attention Deficit Hyperactivity Disorder (ADHD), educational underachievement, specific language and other developmental disorders is documented in several studies (e.g., Werry, 1997). Indeed two primary diagnoses for CD is the rule not the exception (Lambert, Wahler, Andrade & Bickman, 2001). The internal consistency for CD symptoms is only slightly higher than that for symptoms chosen at random (Lambert et al., 2001). This degree of comorbidity threatens the distinctiveness of CD.

Hill (2002) reviews the biological, psychological and social processes in CD. With regard to its aetiology, much evidence is correlative, although attempts at defining causal mechanisms and modelling are increasing (e.g., Krol, Morton & De Bruyn, 2004). The heterogeneity within CD is reflected in the number of different pathways proposed to account for its development. This means that some children described as

conduct disorder may have similar causal pathways to children with ASD. There is some evidence that those with poor peer relationships may be more prone to developing antisocial behaviours (Hill, 2002). A common cause for different trajectories is also proposed, which has received some support. Moffitt, Caspi, Rutter and Silva (2001) highlight the role of neurodevelopmental problems in the origin of severe and persistent antisocial behaviour, which may help account for the preponderance of males. They also consider the possibility of a shared neurodevelopmental basis for autism and early-onset persistent antisocial behaviour. Currently, there are too many competing possibilities suggesting the need for prospective studies with a good sample sizes (Hill, 2002).

Hill (2002) also highlights the methodological variation both in diagnostic classification systems, and with regard to aggression and antisocial behaviour scales. Warden and Mackinnon (2003) argue that scales are often not specific enough concentrating on unobservable inner states (inferred intent) rather than observable behaviours. This could mean that hostility and non-compliance are attributed to behaviours that may result from social communication difficulties consistent with ASD.

Whilst the diagnostic ambiguities of ASD are acknowledged, (e.g., Macintosh & Dissanayake, 2004), it may be argued that ASD is less heterogeneous, especially when formally diagnosed through multi-informants with a comprehensive developmental history. It is more theoretically plausible that a child may present with conduct problems secondary to social communication problems than vice versa. This may be reflected in that neither diagnostic classification system refers to CD in

the differential diagnosis sections relating to PDD. Moreover, ICD-10 (WHO, 1993) mentions PDD in the differential diagnosis section for CD. The preference for DSM criteria (e.g., DSM-IV: APA, 1994) in the literature is noted, with few studies referring comprehensively to ICD criteria (e.g. ICD-10 WHO; 1993).

3.3. Diagnostic Classification Systems: Section Summary

A close look at the diagnostic classification systems raises the possibility of symptom overlap between ASD and CD, which may contribute to misclassification. The triad of impairment, characteristic of ASD, may produce behaviours congruent with a diagnosis of CD. Indeed, it is recognised that CD may be symptomatic of other conditions (ICD-10: WHO, 1993). Notably, CD does not appear in the differential diagnosis sections for PDDs in the main classification systems. Additionally, methodological and taxonomic difficulties associated with CD increase the likelihood of misclassification of ASD as CD.

4.0. Similarities and Differences Between ASD and CD

It is not the purpose of this paper to argue that ASD and CD are the same. Indeed the few comparative studies conducted show important differences. Reviewing comparative studies informs the case for misclassification both in terms of symptom overlap, and with regard to comorbidity. Children diagnosed with Autism, High Functioning Autism and Asperger's are referred to as having ASD, as distinctions between these are not the focus of this review.

4.1. Differences Between ASD and CD

Comparative studies show greater impairments in children with ASD compared to those with CD for the characteristic triad of impairment (Gilchrist et al, 2001; Green, Gilchrist, Burton & Cox, 2000; Happé & Frith, 1996). The Autism Diagnostic Interview (ADI-R: Lord, Rutter & Le Couteur, 1994) and the Autism Diagnostic Observation Schedule (ADOS: Lord et al., 1989) both show greater difficulty in verbal and non verbal behaviour for children with ASD (Gilchrist et al., 2001). Children with ASD are more likely to have compulsions and disinhibitions than those with CD (Green et al, 2000). Conversely, children with CD are more likely to steal, bully and use alcohol or tobacco (Green et al., 2000; Happé & Frith, 1996). Finally, children with ASD show significantly greater bizarre speech and excessive or peculiar preoccupations than children with CD (Gilchrist et al., 2001; Happé & Frith, 1996).

4.2. Similarities Between ASD and CD

4.2.1. Symptom overlap

The case for ASD presenting as CD can be considered in terms of symptom overlap. Children with CD and those with ASD are equally likely to have problems with their threshold of annoyance, their perception of their own role in problems and their perception of a range of cues used to detect annoyance (Green et al., 2000). They are also comparable in terms of their experience of teasing and coping with teasing (Green et al., 2000). Pertinent to the proposed argument, Green et al. (2000) identify symptom overlap for irritability, temper tantrums, defiance to parents and aggressiveness. In the Gilchrist et al. (2001) study, approximately a third of the CD group are reported to have some social abnormalities in sharing others' pleasure, coming for comfort, affective reciprocity, inappropriate facial expression, social disinhibition and friendships. Over activity and poor attention are also reported for children with ASD and for children with CD (Gilchrist et al., 2001; Green et al., 2000).

Difficulties in verbal and non-verbal behaviour are identified in 10% of children with CD (Gilchrist et al., 2001) based on the ADI-R (Lord et al., 1994). This could imply that a tenth of the CD sample show ASD type problems at a sub-clinical level. Alternatively, it could be argued that a proportion of children classified as ASD may have unidentified CD. Indeed, there is evidence to suggest comorbid antisocial and disruptive behaviour in ASD (Tonge, Brereton, Gray & Einfeld, 1999). This raises the dilemma as to where the primary deficit lies. It may be argued that genuine concurrence of CD in the context of ASD is possible. Indeed few studies examine the possibility that autism could be comorbid with other psychiatric conditions

(Medical Research Council, 2001). Conversely, it could be argued that ASD in addition to a diagnosis of CD seems implausible given that CD can be symptomatic of other conditions.

The Children's Communication Checklist (CCC: Bishop, 1998) used in the Gilmour, Hill, Place and Skuse (2004) study assesses pragmatic language skills. Parent and teacher ratings on this measure indicate that two thirds of clinically referred children, with a diagnosis of CD, have pragmatic language impairments similar in nature and degree to children diagnosed with ASD. In addition, over two thirds of excluded or at-risk-of-exclusion primary school children have a teacher rated CCC pragmatic composite score in the clinical range (Gilmour et al., 2004).

Whilst the Gilmour et al. (2004) study identifies a significant proportion of children diagnosed with CD as having clinically significant pragmatic language difficulties on the CCC (Bishop, 1998), Adams, Green, Gilchrist and Cox (2002) find that their ASD group showed more pragmatically problematic responses to emotional conversation than the CD group. Methodological differences – CCC scores in the former and conversation analysis in the latter - are noted. Additionally, the sample definition differs in that the Adams et al. (2002) study uses the ADI-R (Lord et al., 1994) and the ADOS (Lord et al., 1989), although both diagnose according to ICD-10 (WHO, 1993). Whilst the Gilmour et al. (2004) study has a more impressive sample size, the exclusion criteria in terms of comorbidity and comprehensive data on IQ is more favourable in the Adam et al. (2002) study. It is further noted that the subdomains of Stereotyped Language and Interests on the CCC show equal

impairment for children at-risk-of-exclusion and children diagnosed with ASD (Gilmour et al., 2004).

4.2.2. Comorbidity

Comorbidity and complex decisions regarding primary and secondary diagnosis also highlight the potential for misclassification of ASD. Green et al. (2000) report difficulty in distinguishing symptoms relating to comorbidity from the core disorder for children with ASD. Indeed 45% of these children have an externalising disorder (CD, pervasive inattention or over activity). Additionally, in the Gilmour et al. (2004) study 30% of conduct disordered children show clinically significant impairment in two out of three domains for the autistic triad of impairment.

Given the degree of symptom overlap, it is important that studies report and control for comorbidity, as performance on tests may be influenced by, for example, comorbid hyperactivity and impulsivity (Happé & Frith, 1996). It is conceivable that more rigour is taken over differential diagnosis in studies comparing ASD with CD.

4.3. Similarities and Differences between ASD and CD: Section Summary

Overall the reviewed studies suggest greater impairment for both verbal and non-verbal behaviour in children with ASD compared to those with CD (Gilchrist et al., 2001). This includes significantly greater stereotypic behaviour in ASD compared to CD (Gilchrist et al., 2001; Happé & Frith, 1996). Nonetheless, the degree of symptom overlap between children with ASD and CD is striking, notably as concerns irritability, temper tantrums, defiance to parents and aggressiveness (Green

et al., 2000). The potential for misclassification is further illustrated in the ambiguity regarding decisions relating to comorbidity and primary diagnosis (Gilmour et al., 2004; Green et al., 2000).

5.0. Misclassification

5.1. Under-detection of ASD

It is generally recognised that ASD continues to be under-detected and consequently under-treated. The number known to clinical services is far lower than the true population prevalence (Baird, et al., 2000). Case identification for ASD is now recognised to lie somewhere between 20 and 60 per 10,000 (Chakrabarti & Fombonne, 2001; Williams, Higgins & Brayne, 2006; Yeargin-Allsopp et al., 2003). However, autistic traits may affect as many as 140 boys and 30 girls per 10,000 (Constantino & Todd, 2003). Additionally, deficits in social reciprocity and communication skills may be continuous with a general population distribution (Charman, 2002). Changes in the diagnostic criteria, recognition of a broader spectrum and increased professional awareness are thought to have contributed to the increased prevalence rates (Charman, 2002; National Autistic Society [NAS], 2001; Wing & Potter, 2002).

5.2. Late Detection and Misclassification of ASD

A related issue is that of late detection. Almost half of people with Asperger's Syndrome surveyed by the National Autistic Society were not diagnosed until they were 16 years of age (NAS, 2006). The presence of conduct problems in ASD may account for misdiagnosis (Gadow, Devincent, Pomeroy & Allen, 2005; Gilmour et al., 2004; Green et al., 2000; Tonge et al., 1999). Other symptoms may further delay a diagnosis of ASD, such as hyperactive, inattentive and impulsive symptoms in early childhood, and depression or anxiety in adolescence. ASD may indeed be misclassified as common developmental psychopathology. Towbin, Pradella,

Gorrindo, Pine and Leibenluft (2005) report that 8% of children in a mood disorders clinic screened positive for ASD, a figure consistent with recent prevalence rates (e.g., Charman, 2002).

5.3. Reinterpretation of Behavioural Markers Associated with CD

This paper considers the argument that a subgroup of children with ASD are undetected and subsumed under CD. For this subgroup ASD could constitute a primary deficit with conduct problems as a secondary manifestation. Children with ASD may show poor concentration, become easily overwhelmed with information, and be unable to interpret subtle social rules (NAS, 2000). Additionally, there is anecdotal support, from interviews with teachers, of late detection of pragmatic language disorder in the context of bizarre and aggressive behaviour (Watling, 2004).

It is now recognised that 75% of children with ASD have IQs within the normal range, where previously this was thought to be the reverse (Medical Research Council, 2001). Nonetheless high functioning children with ASD show significant social disability. Indeed, high functioning children with ASD are at increased risk of school exclusion compared to their cognitively less able counter-parts (NAS, 2000; NAS, 2001).

5.3.1. Conduct disordered behaviour and the autistic triad of impairment

Misclassification of children with ASD is most plausible for those functioning in the normal range of intelligence. Indeed good verbal skills contribute to lower detection

(Tsatsanis et al., 2004). Of interest is Coplan's (2003) description of the mild expression of atypical features associated with the triad of impairment.

With regard to reciprocal social interaction, children with ASD characteristically have poor perspective taking skills which adversely affect their social communication. *Mentalising* or *theory of mind* are terms that refer to the capacity to attribute mental states to oneself and to another. This ability to represent behaviour in terms of mental states enables understanding of another's behaviour (Fonagy & Target, 1997). A child with ASD may have good eye contact and show interest in others, whilst not knowing how to join in appropriately. They may also show marked difficulty in both initiating and sustaining conversation and approach people in socially inappropriate ways. This awkwardness may be perceived as hostility towards others or unwillingness to make friends with peers. Additionally, social communication problems would translate to little awareness of social hierarchy, e.g., not treating teachers with due deference. Not understanding social rules may lead to behaviour being interpreted as purposeful rule breaking (NAS, 2000).

With regard to communication skills, children with ASD may speak in well-articulated sentences but lack pragmatic language skills, e.g., fail to pick up on inferred meaning (Rapin, 1996). A child may therefore respond to a teacher's request to sit down by sitting on the floor where they heard the request, rather than going back to their seat. This could be interpreted as wilful defiance. Children with ASD may show a lack of emotional response to others' verbal and non-verbal communication, e.g., failing to detect irritation in others (Green et al., 2000). This, in turn, could lead to their behaviour being interpreted as a lack of sensitivity, or worse,

as provocative. Furthermore, lack of guilt or remorse may be a result of not understanding the wrongdoing.

Stereotyped behaviour, circumscribed interests, and activities may emerge as a preference for routines, or repetitious play of a subtle nature. Imposing rigidity and routine on everyday activities in addition to low tolerance to routine changes may give rise to reactive aggression.

5.3.2. Aggression and ASD

Tonge et al. (1999) report clinically significant antisocial and disruptive behaviour in children with ASD when IQ is controlled. Children with ASD may experience the school environment and peer interactions as overwhelming and bewildering due to their lack of social understanding. Physical aggression may, in some circumstances be the only means of expression for a child with ASD (NAS, n.d.). Furthermore, such children may lash out physically in response to bullying. Finally, fighting may represent a means of distance regulation in some children with ASD.

5.3.3. Other conduct disordered behaviour and ASD

Whilst deceit is not usually associated with ASD, Green et al. (2000) find that children with ASD are able to tell lies. Moreover children with ASD may steal due to a failure in understanding social rules around borrowing and the need to ask for permission. Fire setting may occur through an absence of fear, or a particular special interest in fire. On the surface, bullying and threatening others would seem less likely in children with ASD. It is however possible that adults rating a child's

behaviour may wrongly attribute purposeful intent to the actions of a child with ASD.

5.4. Misclassification: Section Summary

ASD may be misclassified as CD through the presence of secondary conduct disturbed behaviours. Behavioural descriptors for CD can be reinterpreted as stemming from an underlying social communication deficit, as found in ASD. Late diagnosis of ASD, (NAS, 2006), and under-detection in the community, (Towbin et al., 2005), add weight to the argument for misclassification.

6.0. Sample Definition

This section examines whether some children, described in the literature as conduct disordered, may have been misclassified. This argument is explored through close inspection of sample definition in research on children with conduct disordered behaviour.

6.1. Diagnostic Classification Systems

The DSM (DSM-IV: APA, 1994; DSM-III-R: APA, 1987) is more frequently used than the ICD-10 (WHO, 1993) in the studies reviewed. Again it is noted that PDD does not appear under the exclusion criteria for CD in the DSM. Pertinent to the argument proposed are the use of complete versions of structured diagnostic interviews, contrasted with checklists; the reporting of exclusion criteria and comorbidity in the samples. The use of checklists may not include consideration of developmental history which is essential in making a differential diagnosis. The reporting of exclusion criteria is important in assessing the likelihood of children with ASD being inadvertently included in samples. The absence of reported comorbidity may mask critical dilemmas over primary and secondary diagnosis.

Many studies do not make clear the degree to which diagnostic information is recorded including developmental history (e.g., Frankel & Feinberg, 2000). Without such detail misclassification is more likely. For other studies it is explicit that the whole DSM-IV (APA, 1994) interview has been carried out (e.g., de Wied, Goudena & Matthys, 2004). Several studies do not use structured interview schedules that

include developmental disorders (e.g., Lambert et al., 2001; Pine, Cohen, Cohen & Brook, 2000).

Furthermore, symptom lists for unspecified childhood disorders are employed in defining samples (e.g., Shelton et al., 1998). There are also examples of the use of checklist behaviours in isolation i.e., without consideration of other childhood disorders which means that children with ASD may be mislabelled as conduct disordered. The Sutton, Reeves and Keogh (2000) study uses a 21 item self-report behaviour checklist comprised of the diagnostic criteria for ODD and CD according to DSM-III-R (APA, 1987). Whilst this study uses a community sample, caseness is reported in 10% of the sample for CD and in 26% of the sample for ODD.

It is noted that the DSM-III-R (APA, 1987), which does not include Asperger's Disorder as a separate category, is used for a number of studies (e.g., Coy, Speltz, DeKlyen & Jones, 2001; Matthys, Cuperus, & van Engeland, 1999; Shelton et al., 1998). This may imply less consideration for the assessment of higher functioning forms of autism.

6.2. Comorbidity and Exclusion Criteria

Whilst many studies are careful to exclude children with intellectual impairment, ASD rarely appears in the exclusion criteria (e.g., Herpertz et al., 2005). When children with ASD are excluded from studies it is not always clear how this is assessed (e.g., Law & Sivy, 2003). In some studies disorders are diagnosed without any exclusionary criteria (e.g., Pine et al., 2000). Another issue is the reporting of comorbidity. Whilst several studies report comorbidities (e.g., Orbio de Castro,

Koops, Veerman, & Bosch, 2005) some studies do not (e.g., Dunn, Lochman & Colder, 1997; Katz & Windecker-Nelson, 2004).

6.3. Multi-informant Assessment

There are many examples of multi-informant information used to define samples (e.g., Matthys et al., 1999; Shelton et al., 1998; Webster-Stratton & Lindsay, 1999) which strengthens the diagnosis reducing the influence of single informant bias. However, deferring to consensus diagnosis may suggest ambiguity in diagnosis in some cases (e.g., Gilmour et al., 2004). It is plausible that the reason for referral or presenting problem, such as conduct disordered behaviour, may bias assessment to the extent that ASD is not thoroughly assessed.

Numerous studies identify samples according to diagnostic classification systems and with reference to general measures of behaviour (e.g., Webster-Stratton, Reid & Hammond, 2001). Two frequently used measures are presented to explore whether some of the behaviours described could be endorsed by children with ASD.

6.4. Behaviour Questionnaires

6.4.1. Strengths and Difficulties Questionnaire

The Strengths and Difficulties Questionnaire (SDQ: Goodman, 1997) is a brief behavioural screening tool comprising of 25 items. It yields the following five subscales: emotional symptoms; conduct problems; hyperactivity; peer problems; and prosocial behaviour.

Close inspection of the SDQ items and corresponding subscales (Goodman, 1997) indicate that children with ASD could endorse many of these, reaching cut-off levels. With regard to the conduct problems scale, children with ASD could endorse getting angry, disobeying and fighting. In the Law and Sivyver (2003) study 60% of excluded primary school children exceed cut-off on this subscale based on teacher report.

Given the comorbidity of attention and concentration difficulties in CD and in ASD (e.g., Gilmour et al., 2004) all items on the hyperactivity scale could be descriptive of a child with ASD. Indeed, diagnostic guidelines preclude a diagnosis of ADHD for Autistic Disorder (DSM-IV; APA, 1994). Law and Sivyver (2003) report 65% of excluded primary school children exceed cut-off on this subscale.

Additionally, a child with ASD would score up on the peer problems scale and possibly show difficulties on the other two scales, namely prosocial behaviour and emotional symptoms. Law and Sivyver (2003) report that over half of the excluded children exceed cut-off on the peers and prosocial behaviour subscales, and a tenth on the emotional subscale.

Using the SDQ (Goodman, 1997) Hughes and colleagues carried out a series of studies on pre-schoolers in the community (Brophy & Dunn, 2002; Dunn & Hughes, 2001; Hughes, Cutting & Dunn, 2001; Hughes & Dunn, 2000; Hughes, Dunn & White, 1998; Hughes, White, Sharpen & Dunn, 2000). Forty children were defined as *hard-to-manage*, with a further 40 serving as comparison children. Allocation to group was based on parent and teacher SDQ ratings. The 90th percentile was chosen as a cut-off for the hyperactivity and conduct problem subscales.

6.4.2 .Children's Behaviour Checklist

The Children's Behaviour Checklist (CBCL: Achenbach, 1991) is another commonly used measure. It comprises of a 134 item standardised checklist of childhood behavioural problems, measuring factors including hyperactivity, aggressiveness and delinquent behaviour. These allow for the calculation of externalising, internalising and total problem subscales. The externalising subscale encompasses the aggression and delinquency subscales.

Again inspection of the CBCL (Achenbach, 1991) reveals that children with ASD could conceivably score within the clinical range for externalising problems including items tapping into the aggression subscale. Coy et al. (2001) use the CBCL on preschool boys with ODD. A *t* score of 65 or above was required on the externalising subscale, from parent report, for inclusion in the clinic group. Moreover, Webster-Stratton and Lindsay (1999) use the parent report total problem score as a screening criterion for inclusion in their study where CBCL scores differentiate the groups.

6.4.3. General behaviour questionnaires: Summary

General behaviour questionnaires such as the SDQ (Goodman, 1997) and the CBCL (Achenbach, 1991) are used to screen, and sometimes define samples of children with conduct problems. Children with ASD can easily meet cut-off, as they may present with conduct problems in addition to other non-specific symptoms secondary to the core social communication deficit. The use of general behaviour questionnaires represents another possible way in which children with ASD may be inadvertently included in CD samples.

6.5. Sample Definition: Section Summary

There are various ways in which children with ASD may be misclassified. This may occur through the use of general measures of behaviour as screening tools for inclusion in studies or for sample definition. With regard to diagnostic structured interviews, the depth of information sought including developmental history shows considerable variation, as does adherence to the complete interview. Inconsistent reporting of exclusion criteria and comorbidity increases the likelihood of misclassification. The preponderance of DSM-IV (APA, 1994) over ICD-10 (WHO, 1993) is again noted with reference to PDD appearing as an exclusion criterion for a diagnosis of CD in the latter. It would be prudent for studies to screen for ASD in CD samples to exclude the possibility of children with ASD being inadvertently included.

7.0. Social Information Processing

This section looks at social information processing (SIP) in relation to aggressive and disruptive behaviours (Dodge, 1993). This literature is chosen as the SIP model is a major explanatory model for CD. This section considers SIP in relation to CD, and how findings in this area do not necessarily exclude ASD. The SIP model is not proposed as a suitable explanatory framework for ASD. Rather, the possibility that some SIP findings may be accounted for by an ASD presentation is explored.

The SIP model explains socially maladjusted behaviour in children (Crick & Dodge, 1994). It proposes that behavioural difficulties result from poor or biased SIP. Biologically limited capabilities and social rules or schema acquired through experience guide behaviour. During social interactions a sequence of online processing steps occur (see Figure 1). Competence at each step is associated with adaptive social functioning. In contrast, poor or biased processing at the various steps is associated with maladaptive social behaviour. When engaged in social interaction, the child will attend to and encode certain internal and external cues. The next step involves the interpretation of the encoded information. This involves making attributions of causality and intent as well as other interpretative processes, such as self and other evaluations. A desired outcome is then selected with responses generated in pursuit of this outcome. Responses are then evaluated, and the most favourable one selected before the behavioural response is enacted.

There are relatively few studies on SIP in clinically referred children (Orbio de Castro, Koops, Bosch & Monshouwer, 2002). The different steps are considered individually with corresponding research findings outlined. The purpose of this

section is to explore the possibility that an ASD presentation could produce similar SIP findings.

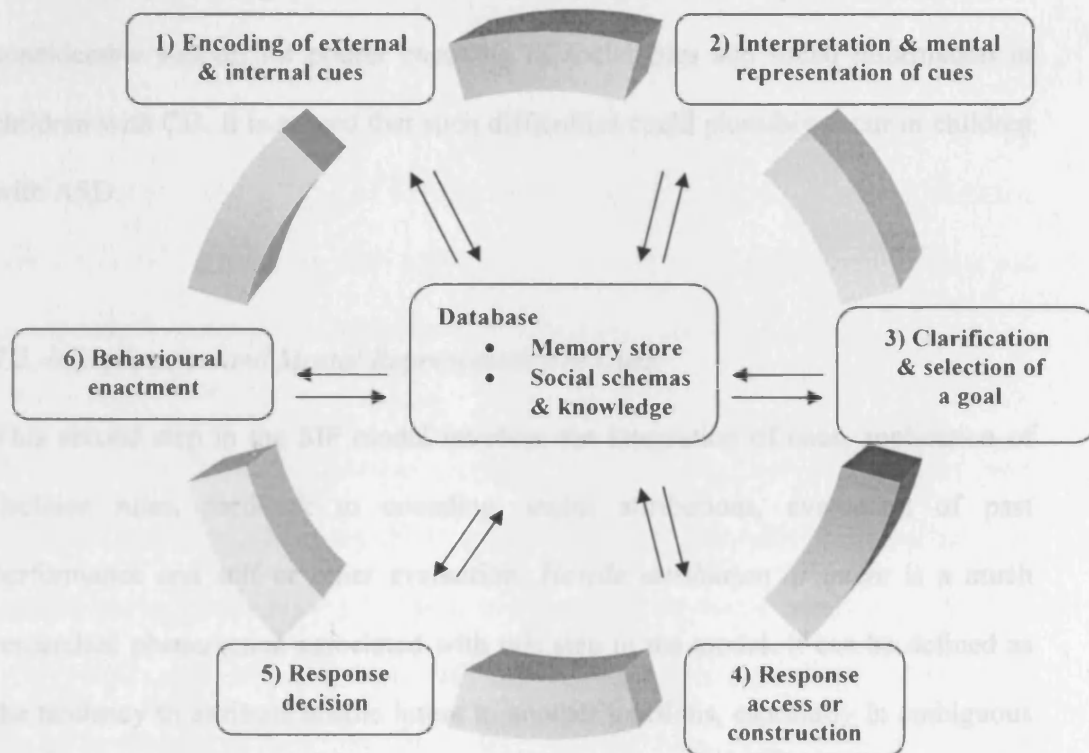


Figure 1. Reformulated social information processing model.

7.1. Encoding of External and Internal Cues

This first step of the SIP model involves the encoding of external and internal social cues. This stage also draws on sensation, perception, attention and focus. Boys with CD encode fewer social cues than normal controls (Coy et al., 2001; Orbio de Castro et al., 2005; Matthys et al., 1999). Children with ASD may be expected to misperceive or fail to accurately attend to social cues, and consequently behave in ways that do not fit with the social context. They may be perceived as acting in a

rude or odd manner. Indeed Green et al. (2000) find that both children with ASD and children with CD show impaired perception of cues to detect annoyance. Furthermore, children with ASD may have specific perceptual difficulties in their information processing (Femia & Hasselmo, 2004). In summary, there seems to be considerable support for poorer encoding of social cues and social information in children with CD. It is argued that such difficulties could plausibly occur in children with ASD.

7.2. Interpretation and Mental Representation of Cues

This second step in the SIP model involves the integration of cues, application of decision rules, feedback to encoding, intent attributions, evaluation of past performance and self or other evaluation. *Hostile attribution of intent* is a much researched phenomenon associated with this step in the model. It can be defined as the tendency to attribute hostile intent to another's actions, especially in ambiguous social situations with negative outcomes (Schulz & Shaw, 2003). Hostile attribution of intent is also referred to as *hostile attributional style* and *hostile biased processing* in the literature. For consistency the term hostile attribution of intent is used here.

Orbio de Castro et al. (2002) report on a meta-analysis of hostile attribution of intent and aggressive behaviour which includes 41 studies published between 1974 and 1999. Hostile attribution of intent is thought to trigger problematic social interactions limiting opportunities to learn and practice more prosocial behaviours. A reliable association between hostile attribution of intent and aggressive behaviour is reported (Orbio de Castro et al., 2002). Whilst reactive, rather than proactive aggression, is expected to yield greater effect sizes, studies do not consistently report this

distinction (Orbio de Castro et al., 2002). It could be argued that children with ASD would show more reactive aggression in response to a perceived threat, e.g., if their routine were disrupted, rather than proactive or instrumental aggression. Another influential factor on hostile attribution of intent is peer sociometric status. The meta-analysis shows a stronger effect size when children with aggressive behaviours and peer rejection are selected (Orbio de Castro et al., 2002). Children with ASD may receive poor peer sociometric ratings. Indeed, as a group, peers report negative attitudes towards a child with autism compared to a typically developing child (Campbell, Ferguson, Herzinger, Jackson & Marino, 2004).

More recently Orbio de Castro et al. (2005) find that clinic referred boys attribute more hostile intent to a peer than comparison boys. They also find that reactive aggression is related to hostile intent and less guilt or shame attribution. Children with ASD may fail to understand a wrongdoing due to their difficulty in understanding social rules, and consequently show little guilt or shame. To this poor perception of their own role in problems for children with ASD and CD is noted (Green et al., 2000).

Deficiencies in mentalising or theory of mind are characteristic of ASD (e.g., Kleinman, Marciano & Ault, 2001). Children with ASD may therefore be unable to make sense of complex social interactions and misinterpret intent. Specific difficulties with pragmatic communication may also contribute to misunderstandings and associated misattributions of intent, e.g., understanding sarcasm. Children with ASD may also have certain sensitivities of which others may not be aware, e.g., people coming too close, which could be perceived as threatening.

Poor mentalising abilities characteristic of, but not unique to, ASD are documented in other clinical groups (e.g., Hughes, 2004). There is some support for mentalising deficits in children with CD (Hughes, Dunn & White, 1998) and in young offenders (Mundy, 2004). Good mentalisation abilities are, however, associated with bullying behaviour (Sutton, Smith & Swettenham, 1999) and forensic populations (Abu-akel & Abushua'leh, 2004). This points towards a complex relationship between mentalising abilities and social behaviour. To this the heterogeneity of children classified as conduct disorder is noted. It is plausible that poor mentalising skills characterise a subgroup of children labelled as conduct disorder, and that these may include children who better fit an ASD profile.

In sum there is considerable support for hostile attribution of intent in children with conduct problems. However, methodological variations and moderating factors mean that effect sizes vary considerably (Orbio de Castro et al., 2002). It is argued that children with ASD may appear to show hostile attribution of intent on account of their core social communication deficits.

7.3. Clarification of a Goal

This step concerns the clarification or selection of a goal and also involves arousal regulation. Children who tend to construct and pursue goals that are inappropriate to particular social situations are likely to become socially maladjusted (Crick & Dodge, 1994). Orbio de Castro et al. (2005) find that aggressive boys show less adaptive emotion regulation strategies – generating less solutions, employing less distraction and not knowing what to do relative to comparison children. They also say that emotion can only be regulated by others more often than comparison

children. Poor emotion regulation may also be observed in children with ASD (Kohler, 2004). Indeed similarities are reported between children with CD and children with ASD in terms of low threshold of annoyance (Green et al., 2000).

7.4. Response Access and Construction

This fourth step involves the generation of responses and the application of response rules. As far as response access or construction is concerned more aggressive, less prosocial children show a smaller and less flexible response repertoire. Matthys et al. (1999) find that boys with CD generate fewer responses than normal controls. Rigidity with regard to social communication and social problem solving is consistent with an ASD presentation.

7.5. Response Decision

This fifth step involves representation of potential consequences, evaluation of outcomes and self efficacy. Aggressive children are more likely to choose responses that involve aggression or non-normative behaviours, and are less likely to make decisions involving friendly behaviours (Dodge, 1993). Clinically referred boys generate and select more aggressive responses compared to comparison boys (Coy et al., 2001; Orbio de Castro et al., 2005; Matthys et al., 1999). Furthermore, 7 year olds with conduct problems give fewer positive solutions to hypothetical conflict than comparison children (Webster-Stratton & Lindsay, 1999). Interestingly, non-clinical samples show maladaptive response generation as a mediator in the development of early conduct problems (Schultz & Shaw, 2003). Aggression and

problem solving avoidance are also associated in delinquency (Jaffe & Zurilla, 2003).

Children with ASD can show clinically significant levels of antisocial behaviour (Tonge, et al., 1999). Such children may be more likely to choose aggressive responses due to low frustration tolerance, rigidity and insistence on routine. Furthermore poor emotion regulation and poor impulse control (Kohler, 2004) may increase the likelihood of aggressive responses. Additionally, lower social competence may mean that such children have few good social problem solving solutions in their store of experiences.

7.6. Behavioural Enactment

This sixth and final step proposed in the SIP model concerns behavioural enactment. Children with CD show more aggressive responses and higher ratings of enactment or approval of aggressive responses than comparison children (Orbio de Castro et al., 2005; Matthys et al., 1999). Children with ASD may have difficulties conceptualising the consequences of their actions. Additionally, previous aggressive behaviour may have been negatively reinforced e.g., removal from an overwhelming social situation.

7.7. Critique of the Social Information Processing Model

In the interests of brevity, the theoretical and methodological difficulties associated with the SIP model are merely outlined. Certain aspects of the model have been insufficiently elaborated and investigated, such as the assumption that emotion is

involved at each step. Although hostile attribution of intent is studied as part of the second stage of the SIP model, it may also involve encoding that constitutes the first stage in the model. With regard to the methodology, the research designs do not allow casual links between social processing and aggressive behaviour to be made. Moreover, standard research tasks tap into reflective and controlled processing and therefore cannot be equated with the automatic processing that occurs in real-life interactions (Crick & Dodge, 1994). This calls for the development of measures with greater ecological validity. The impact of variation in the definition of aggressive behaviours and the range of informants from which information is obtained is also noted (Orbio de Castro et al., 2002).

Finally, due to the scarcity of longitudinal data little is known about the developmental trajectories associated with SIP and its predictive value regarding long-term outcomes (Orbio de Castro et al., 2002). A related critique is the under specification of the development of maladaptive processing styles. The need to theoretically connect SIP with other psychological theories, such as theory of mind and attachment is acknowledged (Nelson, 2005). This is pertinent as poor mentalising abilities may constitute a common route into maladaptive social processing for children with CD and children with other presentations including ASD.

7.8. Social Information Processing: Section Summary

This section considers SIP in relation to CD, and how findings in this area do not necessarily exclude ASD. However, SIP is not advocated as an explanatory model for ASD. The possibility that SIP findings may be accounted for by an ASD

presentation is explored in relation to the different steps of the model. It is argued that children with ASD may show deficits in encoding social cues (Green et al., 2000). Hostile attribution of intent may arise from children with ASD perceiving threats not obvious to others. Impaired mentalising abilities and pragmatic language impairment may contribute to social misunderstandings. Support for hostile attribution of intent in children with CD comes from studies eliciting reactive rather than instrumental aggression, which may be more frequently observed in children with ASD. The role of rigidity in ASD is also considered with regard to response decision. Children with ASD may also show poor emotion regulation and low frustration tolerance, which may increase the likelihood of selecting and enacting aggressive responses.

8.0. Summary and Conclusions

This paper considers the argument that a subgroup of children with ASD are undetected and subsumed under CD or similar descriptors. Close examination of the diagnostic classification systems reveals some interesting points. Firstly, CD can be symptomatic of other conditions. Secondly, PDD appears in the differential diagnosis section for CD (ICD-10; WHO, 1993), such that a diagnosis of PDD overrides one of CD. To this the over representation of DSM (e.g., DSM-IV; APA: 1994) in the studies reviewed is noted where PDD does not appear under the differential diagnosis section for CD. Methodological and taxonomic difficulties related to CD mean that misclassification of ASD is possible (Werry, 1997). Of importance is the significant comorbidity of CD with ADHD and other diagnoses, which illustrates the heterogeneity of children classified as conduct disordered (Lambert et al., 2001).

Whilst symptom overlap between ASD and CD may not be immediately obvious from the diagnostic classification systems, reinterpretation of the behavioural markers for CD demonstrates that a child with ASD could endorse diagnostic criteria for CD. Indeed whilst comparative studies show certain differences, there is considerable symptom overlap. Relevant to the current discussion is symptom overlap for: irritability; temper tantrums; defiance to parents; and aggressiveness (Green et al., 2000). Moreover, a significant proportion of children referred for conduct problems show impairments in social communication consistent with ASD (Gilmour et al., 2004). To this, under-detection and late diagnosis of ASD is noted (Towbin et al., 2005). There is also potential for misclassification in research with regard to sample definition, through inconsistent adherence to structured diagnostic

interviews, inadequate developmental history and the use of checklist behaviours. Under-reporting of exclusion criteria and comorbidity further increase the likelihood for misclassification.

SIP difficulties are reported for children with CD, particularly as regards hostile attribution of intent (Orbio de Castro et al., 2002). Whilst the SIP model is not advocated as an explanatory model for ASD, this paper argues that children with ASD could produce similar SIP findings. Children with ASD may be expected to show difficulties in encoding social cues. Hostile attribution of intent may arise from children with ASD perceiving threats not obvious to others. To this deficits in mentalising and pragmatic language are noted. The role of rigidity is also considered with regard to response access. Furthermore, poor emotion regulation and low frustration tolerance may increase the likelihood of children with ASD selecting and enacting aggressive responses.

This paper argues the case for undetected ASD in children presenting with CD. A critique of a selection of studies highlights the importance of good methodology, specifically as concerns the use of diagnostic measures, the application of exclusion criteria and the assessment of comorbidity. Children with ASD functioning within the normal range of intelligence present with subtle social communication difficulties that may be masked by surface secondary conduct problems. Such children provide a challenge for assessment, detection and the provision of appropriate services. This paper demonstrates the need for community and research screening for ASD in children with conduct problems.

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PART II

EMPIRICAL PAPER

SCHOOL EXCLUSION AND SOCIAL COMMUNICATION DEFICITS: AN EPIDEMIOLOGICAL STUDY

1.0. Abstract

Conduct problems are the most common reason for referral to community child and family services (Office for National Statistics, 2000). They are associated with poor long-term outcomes and considerable public expenditure (Scott, Knapp, Henderson & Maughan, 2001). Primary school children excluded from school who have Conduct Disorder constitute a poorly defined group. This study aims, in the first instance, to replicate the Gilmour, Hill, Place and Skuse (2004) findings of previously undetected pragmatic language deficits in this population using the Children's Communication Checklist (Bishop, 1998). Secondly, this study aims to characterise excluded children using the Developmental, Dimensional and Diagnostic Interview (Skuse et al., 2004). It was predicted that significantly more excluded than comparison children would show clinical levels of pragmatic language impairment and Pervasive Developmental Disorder, independent of age, gender, ethnicity, IQ and socio-economic status. Excluded and at-risk-of-exclusion children were identified by teachers. Parental interviews were supplemented with teacher data. Seventy-two percent of the excluded children met criteria for a Conduct Disorder. In addition, 42% of excluded children, compared to none in the comparison group, fell in the clinical range for pragmatic deficits. A striking 35% of excluded children met criteria for a Pervasive Developmental Disorder. This study provides a diagnostic picture indicative of undetected Autistic Spectrum Disorder in children excluded from school. Limitations are discussed and wider clinical and research implications considered.

2.0. Introduction

2.1. The Problem of Exclusion

The number of permanent exclusions from school has more than tripled from 3,000 in 1990-1991 to 9,290 in 2002-2003 (Department for Education and Skills, [DfES] 2004). The highest risk group are male, have special educational needs, come from areas of social deprivation and from ethnic minority groups (DfES, 2003). Exclusion covers a variety of proceedings. Permanent exclusion means the child may not return to the school from which they have been excluded. Conversely, fixed term exclusion refers to a time limited period of exclusion for up to 15 days, or up to 45 days in any school year (DfES, 2005). Pupil referral units have a high staff to pupil ratio and cater for children excluded from school for very extreme, volatile or violent behaviour. Some children will attend as a result of permanent exclusion, with a view to graded reintegration into mainstream school, whereas others will receive education during a period of fixed term exclusion.

Whilst permanent exclusions from primary schools only represent 14% of all exclusions, a far greater proportion of primary school age children are considered at-risk-of-exclusion (DfE, 2004). This risk remains difficult to quantify in the absence of a centralised record. Furthermore, current policies favouring inclusion for pupils with special educational needs (DfES, 2005) may mask the true number of children who are considered at risk. Furthermore, some schools make unofficial exclusions (DfES January, 2001; Watling, 2004). This may be recorded as authorised absence thus minimising the true level of exclusion in response to government targets, and a desire to avoid stigmatising the child. Similarly, exclusion within school is not

reflected in the statistics; although it may be significant in terms of access to the curriculum and to the social environment, depending upon the frequency with which it is used (Watling, 2004).

2.1.1. Exclusion and children on the autistic spectrum

One in eight children with special educational needs has an Autistic Spectrum Disorder (National Autistic Society [NAS], 2001). The term *Autistic Spectrum Disorder* (ASD) is used here to describe children with Pervasive Developmental Disorders (PDDs) who have severe and persistent impairment in all, or some of the following domains: reciprocal social interaction skills; communication skills; display of stereotyped behaviour or restricted interests (Diagnostic and Statistical Manual of Mental Disorders [DSM-IV]: American Psychological Association [APA], 1994). This includes children meeting diagnostic criteria for Autistic Disorder or Childhood Autism and Asperger's Disorder or Syndrome, as well as children who have general difficulties pertaining to the triad of impairment, but who fail to meet diagnostic criteria for a specific PDD (DSM-IV: APA, 1994; International Classification of Disorders [ICD-10]: World Health Organisation [WHO], 1993).

The special educational needs tribunal has named autism as the second most common category with which it is concerned after general disability which includes literacy (Department for Education and Employment, 2000). Furthermore, one in five children with autism are excluded from school, which is 20 times the national average (NAS, 2000). High functioning children with ASD are at increased risk of school exclusion compared to their cognitively less able counter-parts (NAS, 2001).

Almost 30% of high functioning children with ASD report a history of exclusion from school (NAS, 2001).

2.1.2. Reasons for exclusion

Children excluded from school constitute a poorly specified and understudied group. Other community labels used to describe this population include *hard to manage*, *offender* and *delinquent*. Few studies have described excluded children with reference to clinical measures (Gilmour et al., 2004; Ripley & Yuill, 2005). With such limited knowledge effective service provision is difficult. Additionally, teachers express uncertainty as to the distinction between poor behaviour and behaviour that reflects an underlying problem requiring assessment and management (DfES January, 2001).

The most common reasons cited for exclusion are persistent disruptive behaviour, physical aggression, verbal abuse, and refusal to comply with rules (DfES January, 2001; Gilmour et al., 2004; Ripley & Yuill, 2005). The behaviour of some excluded children could be described as conduct disorder fulfilling diagnostic criteria. Conduct Disorder (CD) is characterised by “a repetitive and persistent pattern of behaviour in which the basic rights of others or major age-appropriate societal norms or rules are violated” (DSM-IV: APA, 1994, p. 93). Conduct disorder behaviour is recognised to be symptomatic of other conditions (ICD-10: WHO, 1993). Oppositional Defiant Disorder (ODD) describes negative, defiant, disobedient and hostile behaviour towards people in authority without any dissocial or aggressive acts violating the law and others’ rights (DSM-IV: APA, 1994; ICD-10: WHO, 1993). For the purposes of this paper CD is used in its broad sense to include

children who are not psychiatrically defined i.e., community samples with significant levels of social impairment who are likely to fulfil diagnostic criteria for CD.

Unfortunately, diagnostic classification of excluded children does not greatly advance understanding, as the category of CD remains very heterogeneous. Indeed two primary diagnoses for CD is the rule not the exception, with the internal consistency for CD symptoms only slightly higher than that for symptoms chosen at random (Lambert, Wahler, Andrade & Bickman, 2001). The extent of comorbidity threatens the distinctiveness of CD. Furthermore, CD is underspecified in terms of causal modelling (e.g., Hill, 2002). Finally, treatment effectiveness for CD is disappointing (Weisz & Jensen, 1999).

2.1.3. Exclusion and long-term outcome

Exclusion amongst primary school children is of particular concern as a proportion of these children may go on to develop “life course persistent antisocial behaviour” (Moffitt, Caspi, Rutter & Silva, 2001). Risk factors include early-onset behavioural problems, lower cognitive abilities, hyperactivity, parental antisocial behaviour and poor discipline (Rutter, 2004). Aggressive behaviours in particular are predicted by socio-demographic disadvantage, exposure to stressful events, developmental deficits and maternal depression (Schultz & Shaw, 2003).

CD is significantly associated with social and educational disadvantage (Scott, Knapp, Henderson & Maughan, 2001). Indeed adults identified in childhood or adolescence as conduct disordered show greater problems in the following domains compared to controls: criminality; mental and physical health; educational and

occupational attainment; marital and social adjustment (Kazdin, 1995; Rutter, 2004). CD is the most common psychiatric disorder in childhood, and the most frequently cited reason for referral to child and adolescent mental health services (Office for National Statistics, 2000). The cost associated with CD in the UK for 10 year old children followed up at aged 28 years is 10 times higher than that for comparison children, exceeding £70,000 per child (Scott, et al., 2001). This figure is contrasted with £23,324 for children with conduct problems. Antisocial behaviour at aged 10 years is therefore a powerful predictor of public expenditure at aged 28 years, even after poor reading and low socio-economic status are controlled (Scott, et al., 2001). Similarly, research on exclusion from school shows that the cost to public services per excluded child exceeds £30,000 (Bagley & Pritchard, 1998).

2.2. Conduct Problems and Social Communication Deficits

Children with disruptive behaviour show problems in social understanding (Milch-Reich, Campbell, Palham, Connelly & Geva, 1999). Theoretical models applied to this area include social learning theory, mentalisation, and attachment. Social information processing, specifically attributional biases explained in terms of learning theory provide a dominant explanatory framework for conduct disordered and antisocial behaviour (Crick & Dodge, 1996; Matthys, Cuperus & van Engeland, 1999). The relationship between mentalising (the ability to represent behaviour in terms of mental state) and conduct problems is also explored in the literature. Research, however, shows mixed findings (e.g., Hughes, Dunn & White, 1998; Sutton, Smith & Swettenham, 1999) suggesting a complex relationship between mentalising abilities and social behaviour. Moreover, attachment in children with CD is also studied. Attachment is described as an affectional bond between the child and

their primary caregiver (Bowlby, 1988). Whilst many studies find an association between externalising disorders and insecure attachment (Guttmann-Steinmetz & Crowell, 2006), several studies report no such association (e.g., Fagot & Kavanaugh, 1990).

There is some evidence for a link between CD and deficits in language-based verbal skills independent of confounding variables, such as socio-economic status (Hill, 2002). Indeed boys excluded from school show previously unidentified expressive language problems (Ripley & Yuill, 2005). Moffit et al. (2001) find a correlation between early verbal and executive function difficulties and life-course persistent antisocial behaviour. They highlight the role of neurodevelopmental problems in the origin of severe and persistent antisocial behaviour, which may help account for the preponderance of males. Moffit et al. (2001) consider the possibility of a shared neurodevelopmental basis for autism and early-onset persistent antisocial behaviour.

2.2.1. Conduct problems and pragmatics

Gilmour, Hill, Place and Skuse, (2004) report pragmatic language deficits in excluded primary school children. Bishop (1997) defines pragmatics as the appropriate use and interpretation of language in the context in which it occurs. Pragmatic competence is, by definition, dependent upon the specific situation in which it is assessed, contrasted with structural language problems that are pervasive. Pragmatic competence develops in infancy encompassing both verbal and non-verbal aspects (Rapin, 1996). Verbal aspects of pragmatics include: initiating conversation; staying on topic; and providing the conversational partner with sufficient information to follow what is being said. Children with these difficulties might fail to pick up

cues of impatience in the listener. In contrast, non-verbal pragmatic communication includes: interpretation of facial expressions; gesture; and prosody. Children with such difficulties may: not look at the person with whom they are talking; fail to use gestures to convey meaning; and talk in a monotone voice or bizarre pitch. Difficulties with pragmatic language are characteristic but not exclusive to children with autistic traits (Bishop & Norbury, 2002). Overlap therefore appears to exist between deficits in pragmatic skills, broader deficits in social communication and disorders on the autistic spectrum (Bishop 1989). This clinical profile is referred to as a *social communication deficit*.

Approximately 50 excluded primary school children from a socio-economically disadvantaged London Borough are surveyed using the Children's Communication Checklist (CCC: Bishop, 1998) in the Gilmour et al. (2004) study. CCC ratings are also reported for clinical samples of children with CD, autism, and ASD, as well as for a comparison group of typically developing children. Teachers rate 69% of excluded children as having significant deficits in pragmatic language skills similar in quality and degree to those found in children attending a social communication disorder clinic who had a confirmed clinical diagnosis. Whilst excluded children perform significantly better than children with autism on the subscales measuring coherence, intelligibility and fluency; they do not differ significantly from children with CD or those with ASD on any of the other subscales measuring pragmatic language (inappropriate initiation, stereotyped language, use of context, rapport, social relationships, or interests). This suggests that pragmatic language impairment co-occurs with conduct problems.

2.3. Conduct Problems Secondary to Social Communication Deficits

It can be argued that a subgroup of children subsumed under CD or similar descriptors may present with disruptive behaviours as a result of an underlying social communication deficit. It is plausible that children with unrecognised problems in social communication are labelled as *antisocial*. Indeed insolent and uncooperative behaviours are frequently cited reasons for exclusion (DfES, January, 2001).

2.3.1. Disruptive and antisocial behaviour in children with ASD

Clinically significant levels of antisocial and disruptive behaviour are reported in children with ASD after IQ is controlled (Tonge, Brereton, Gray & Einfeld, 1999). Children with ASD may experience the school environment and peer interactions as overwhelming, due to a lack of social understanding, and consequently lash out physically (NAS, n.d.). Additionally, there is anecdotal support, from interviews with teachers, of late detection of pragmatic language disorder in the context of bizarre and aggressive behaviour (Watling, 2004). If social communication deficits are indeed causally linked to anti-social behaviour; early detection may inform the development of appropriate interventions and successful management within mainstream education without recourse to exclusion.

2.3.2. Conduct disordered behaviour and the autistic triad of impairment

Misclassification of children with ASD is most plausible for those with normal-range intelligence. The description of the mild expression of atypical features associated with the autistic triad of impairment is therefore of particular interest (Coplan, 2003).

With regard to reciprocal social interaction, children with ASD characteristically have poor mentalising skills, which adversely affect their social communication (e.g., Kleinman, Marciano & Ault, 2001). Whilst a child with ASD may have good eye contact and show interest in others, s/he may not know how to join in appropriately with peers. Furthermore, a child with ASD may show marked difficulty in both initiating and sustaining conversation, e.g., talk repetitively about things that others are not interested in. This awkwardness may be perceived as selfish behaviour, or an unwillingness to make friends with peers. Additionally, social communication problems may manifest as limited awareness of social hierarchy, e.g., pointing out a teacher's mistake in front of the class. Failing to understand social rules may lead to behaviour being interpreted as purposeful rule breaking (NAS, 2000).

With regard to communication skills, children with ASD may speak in well-articulated sentences but lack pragmatic language skills, e.g., fail to pick up on implied meaning (Rapin, 1996). A child may therefore answer a teacher's rhetorical question. This could be interpreted as wilful defiance. Children may show a lack of emotional response to others' verbal and non-verbal communication, e.g., failing to detect annoyance in others (Green, Gilchrist, Burton & Cox, 2000). This, in turn, could lead to their behaviour being interpreted as a lack of sensitivity, or worse, as provocative. Furthermore, lack of guilt or remorse may be a consequence of not understanding the wrongdoing.

Finally with regard to the repetitive and stereotyped behaviour or interests domain of the autistic triad, such behaviour may emerge as a preference for routines, or

repetitious play of a subtle nature. Imposing rigidity and routine on everyday activities combined with low tolerance to routine changes may give rise to reactive aggression.

2.3.3. Symptom overlap and comorbidity

Symptom overlap may further illuminate how social communication problems may be mistaken for CD. Children with CD and those with ASD are equally likely to have problems with: threshold of annoyance; perception of their own role in problems; perception of a range of cues used to detect annoyance; irritability; temper tantrums; poor attention; defiance to parents; and aggressiveness (Green et al., 2000; Gilchrist et al., 2001). Furthermore, over 30% of children with CD are reported to have some social abnormalities in sharing others' pleasure, coming for comfort, affective reciprocity, inappropriate facial expression, social disinhibition and friendships (Gilchrist et al., 2001).

Comorbidity and complex decisions regarding primary and secondary diagnosis also highlight the potential for misclassification of ASD. Green et al. (2000) report difficulty in distinguishing symptoms relating to comorbidity from the core disorder for children with ASD. Indeed 45% of children with ASD are reported to have an externalising disorder (CD, pervasive inattention or over activity). Additionally, in the Gilmour et al. (2004) study, approximately a third of children with CD show clinically significant impairment in two out of three domains for the autistic triad of impairment. The presence of conduct problems in children with ASD may account for misdiagnosis (Gilmour et al., 2004; Green et al., 2000). Furthermore, children with Attention Deficit Hyperactivity Disorder (ADHD: DSM-IV: APA, 1994) and

ODD may show greater social immaturity, thus posing a particular challenge in terms of differential diagnosis from autism (Milch & Dodge, 1984).

2.3.4. Misclassification of ASD as CD in research

Close examination of the literature reveals various ways in which children with ASD may be inadvertently included in samples of conduct disordered children. General measures of behaviour are employed as screening tools for inclusion in studies, or for sample definition (e.g., Coy et al., 2001). With regard to diagnostic structured interviews, the depth of information sought including developmental history shows considerable variation, as does the adherence to a complete diagnostic interview (e.g., Frankel & Feinberg, 2000). Thorough developmental history is essential for the purposes of differential diagnosis. Finally, comorbidities and exclusion criteria are inconsistently reported increasing the likelihood of misclassification (e.g., Katz & Windecker-Nelson, 2004).

2.4. Under-detection of ASD

It is widely recognised that ASD is under-detected and consequently under-treated in the community. Indeed, the number known to clinical services is far lower than the true population prevalence (Baird, et al., 2000). Case identification for ASD is now recognised to lie somewhere between 20 and 60 per 10,000 (Chakrabarti & Fombonne, 2001; Williams, Higgins & Brayne, 2006; Yeargin-Allsopp et al., 2003). However, autistic traits may affect as many as 140 boys and 30 girls per 10,000 (Constantino & Todd, 2003). Furthermore, deficits in social reciprocity and

communication skills may be continuous with a general population distribution (Charman, 2002).

A related issue is that of late detection. Almost half of people with Asperger's Syndrome surveyed by the National Autistic Society report that they were not diagnosed until the age of 16 (NAS, 2006). Furthermore, ASD may be misclassified as common developmental psychopathology. Indeed, Towbin, Pradella, Gorrindo, Pine and Leibenluft (2005) find that 8% of children in a mood disorders clinic screened positive for ASD, a figure consistent with recent prevalence rates (e.g., Charman, 2002).

2.5. Changes in the Conceptualisation of Autism

Autistic features are now viewed along a spectrum (e.g., Bishop, 1989) where deficits in social reciprocity and communication skills may be continuous with a general population distribution (Charman, 2002). Social impairment constitutes the core symptom with a wide range of severity observed across the autistic triad of impairment (social interaction impairments; communication skills deficits; stereotypic and repetitive behaviours). Changes in the diagnostic criteria, recognition of a broader spectrum and increased professional awareness are thought to have contributed to the increased prevalence rates (Charman, 2002; NAS, 2001; Wing & Potter, 2002).

Furthermore, it is now recognised that three quarters of children with ASD have IQs within the normal range, where previously this was thought to be the reverse (Charman, 2002; Medical Research Council, 2001). Nonetheless high functioning

children with ASD show significant social disability; an illustration of which is that they are at increased risk of school exclusion compared to their cognitively less able counter-parts (NAS, 2001). Normal-range cognitive functioning for the majority of children with ASD has important implications regarding both the expression of autistic features and their detection. These changes in conceptualisation of ASD have prompted the development of novel methodologies for the assessment of autistic traits (e.g., the Developmental, Dimensional and Diagnostic Interview [3di]: Skuse et al., 2004).

2.6. Current Study

This study is a descriptive in-depth follow-up of the Gilmour et al. (2004) findings. This study aims to replicate the Gilmour et al. (2004) finding of previously undetected pragmatic language deficits as measured by the CCC (Bishop, 1998). The wider aim of this study is to characterise this rarely identified population of excluded children. The principal measure used is the recently developed *3di* (Skuse et al., 2004). The 3di interview software computes five PDD dimensions: *Reciprocal Social Interaction*; *Social Expressiveness*; *Use of Language and Other Social Communication Skills*; *Use of Gesture and Non-verbal Play*; and *Repetitive or Stereotyped Behaviours and Routines*. In addition, the 3di generates PDD and other childhood psychiatric diagnoses according to ICD-10 criteria (WHO; 1993).

This study aims to assess and compare excluded and at-risk-of-exclusion children with comparison controls. Excluded children and those considered at-risk-of-exclusion are henceforth referred to as *excluded children* with further differentiation

made only when relevant to the discussion. The essential research question is whether excluded children actually suffer from undetected social and language deficits of a quality and degree similar to that of children on the autistic spectrum. It is also hoped that this study will add to the literature on ASD, in light of the scarcity of studies reporting comorbidity of other psychiatric conditions with autistic traits (Medical Research Council, 2001).

2.6.1. Hypotheses

It is predicted that:

1. Significantly more excluded than comparison children will have CCC (Bishop, 1998) ratings in the clinical range on the subscales and the pragmatic composite. It is hypothesised that this will be particularly evident for the subscales that form the pragmatic composite (*Inappropriate Initiation, Coherence, Stereotyped Language, Context, and Rapport*) and for those describing autistic traits (*Social Relationships and Interests*).
2. Significantly more excluded than comparison children will show higher scores on the 3di PDD dimensions (Skuse et al., 2004). Furthermore, significantly more excluded than comparison children will fall into the clinical range on the 3di (Skuse et al., 2004) PDD dimensions compared to classmate controls, some of whom will meet criteria for a PDD (ICD-10: WHO, 1993). These predicted differences will be independent of age, gender, IQ, ethnicity, and socio-economic status.

An additional aim of this study is to obtain a developmental profile for excluded children.

3.0. Method

3.1. Overview

This is a descriptive case comparison study of excluded primary school children and their classmates. The groups were balanced for age, gender, VIQ, ethnicity and many indicators of socio-economic status. The dependent variables were the scores on the CCC (Bishop, 1998) and the 3di (Skuse et al., 2004). The principal hypothesis was that significantly more excluded than comparison children would show clinical impairment on these measures.

3.2. Participants

The overall sample consisted 48 children, of which there were 26 excluded and 22 comparison children. The sample ranged from 6 to 13 years of age and comprised of 41 boys and 7 girls. There were two sets of siblings in both groups. Table 1 shows the mean and standard deviation for age and IQ for both groups.

Table 1: Age and IQ

	<i>M</i> age in years (<i>SD</i>)	<i>M</i> FSIQ (<i>SD</i>)*	<i>M</i> VIQ (<i>SD</i>)	<i>M</i> PIQ (<i>SD</i>)*
Excluded (N=26)	9.21 (1.81)	93.50 (15.23)	98.19 (16.42)	90.23 (13.88)
Comparison (N=22)	9.44 (1.69)	105.82 (17.03)	105.73 (16.21)	104.68 (16.31)

* significant at $p < .05$.

Table 2 shows gender, ethnicity, and English as an additional language across groups. Table 3 shows various measures of socio-economic status for the excluded and comparison groups. Whilst it is acknowledged that several children were in the care of persons other than their parents, the term *parent* is used as this represents the majority of the sample.

Table 2: Gender, Ethnicity and English as an Additional Language

	Sex M:F	Ethnicity (frequency)			Children with English as an additional language (frequency)
		Afro-Caribbean	White	Indian/Pakistani/Bangladeshi	
Excluded (N=26)	23:3	15	10	1	4
Comparison (N=22)	18:4	10	11	1	1

Note. No significant group differences at $p < .05$.

Table 3: Measures of Socio-economic Status

	% currently unemployed*	Parental Education*			Social housing (%)	Single parent (%)	Any contact with social services (%)*	Any child protection concerns (%)*	Any contact with child mental health services (%)*
		16 years or less (%)	Further Education (%)	University (%)					
Excluded (N=26)	50	77	15	8	81	58	77	58	42
Comparison (N=22)	23	18	46	36	77	41	5	0	0

* significant at $p < .05$.

Based on the Gilmour et al. (2004) study a large effect size is predicted for which Cohen (1992) suggests a sample size of 26 per group, $\alpha = .05$. The aim was therefore to recruit 26 excluded and 26 comparison children to the study.

Fifty six primary schools were contacted in a socio-economically deprived London borough including one pupil referral unit. The study benefited from previously established good links with health, education and social services. The final sample came from 16 schools. Primary school teachers from participating schools identified children who had either been excluded, or who were considered at-risk-of-exclusion. Teachers were asked to only consider children who presented with behavioural management difficulties over a period of time, i.e., not children who had violated a rule on one isolated occasion.

Children at-risk-of-exclusion, both with and without a history of exclusion, were included in the excluded group. Seven children were recruited from the pupil referral unit having been permanently excluded from school. Reasons for exclusion or exclusion risk were noted.

Twenty two comparison children were recruited through teacher nomination and recruitment visits to school playgrounds by the researchers (RD & GP). Where possible these were balanced group-wise for age, gender, general ability, ethnicity and socio-economic status to control for variables that may influence the probability of antisocial behaviour (see Tables 1-3).

3.3. Inclusion Criteria

This study was restricted to children and parents fluent in English, which included some families with English as an additional language. All children were born in the UK. Written consent from the parent or legal guardian was sought for all children. Children with a FSIQ below 70 were excluded from the study as the focus was on children with normal-range intellectual functioning. To our knowledge none of the children in our study had previously been assessed for pragmatic language or ASD. Some children had been seen by child and family services for behaviour management and family work.

3.4. Setting

The London borough in which the study took place has a population of over 200,000 of which approximately a quarter is under the age of 15 years (Office for National Statistics, Census, 2001). Further, a third of the population is made up of ethnic minority groups. Unemployment is more than double the national average, and levels of education are low (Office for National Statistics, Census, 2001). The borough also has high rates of family breakdown and children in the care of the local authority. With respect to indices of deprivation which include: income; employment; health; education and training; housing; and crime, the borough ranked among the most deprived nationally (Office for National Statistics, 2001).

3.5. Ethical Considerations

This study has ethical approval from the Great Ormond Street Hospital for Children National Health Service Trust and Institute of Child Health Research Ethics Committee (see Appendix A for letter of approval). Please also see Appendices: B for parent information sheets; C for child information sheets; and D for parent consent and child assent forms.

3.6. Measures

The current study was part of a larger project. Data collected using the 3di (Skuse et al., 2004) were unique to this study. Both projects referred to IQ and CCC (Bishop, 1998) data. The other researcher (GP) collected additional neuropsychological data using the Test of Everyday Attention (Manly, Robinson, Anderson & Nimmo-Smith, 1999) and a battery of social cognition tests (Skuse, Lawrence & Tang, 2005).

3.6.1 .Socio-economic status

Occupation of the main household earner was noted along with level of education. The sample size was insufficiently large to meaningfully categorise occupational groups. Employment status and educational level are therefore reported. Furthermore, single parent status, accommodation type as well as previous social service and child and family mental health service contact were noted (see Table 3).

3.6.2. *General cognitive ability*

The Wechsler Abbreviated Scale of Intelligence (Wechsler, 1999) is used to exclude IQ as a confounding variable. It provides a fast, reliable and valid estimate of intellectual functioning. The Wechsler Abbreviated Scale of Intelligence shows good discriminant validity for global learning disability from typical development, and excellent test-retest reliability (FSIQ: $r = .92$). It comprises four subtests. Vocabulary and Similarities allow for the estimation of VIQ. Block Design and Matrix Reasoning enable PIQ to be estimated.

3.6.3. *Pragmatic competence*

The CCC (Bishop, 1998) was used to assess pragmatic skills. It was designed to distinguish between specific language impairment involving problems with the structure of language and impairment in the social use of language. The questionnaire is composed of 70 statements for which the rater checks whether each item *definitely applies*, *applies somewhat* or *does not apply*. These items contribute to the following subscales: *Intelligibility and Fluency*; *Syntax*; *Inappropriate Initiation*; *Coherence*; *Stereotyped Conversation*; *Use of Context*; *Rapport*; *Social Relationships*; *Interests*. The following subscales combine to give a pragmatic composite score: *Inappropriate Initiation*; *Coherence*; *Stereotyped Conversation*; *Use of Context*; *Rapport*.

Lower scores on the CCC (Bishop, 1998) are indicative of greater impairment. Typical development, with no items describing communication difficulties selected, would score 30 on each subscale. Scores in excess of 30 are due to positive items being endorsed that

describe communicative strengths. Importantly, pragmatic deficits as measured by the CCC are not a non-specific correlate of psychiatric disorders, such as anxiety and depression (Gilmour et al., 2004). Significant clinical impairment is considered for scores at least 2.0 standard deviations below the population mean (Bishop & Baird, 2001). The CCC is incorporated into the 3di (Skuse et al., 2004) interview, such that a proportion of the CCC items contribute to the 3di diagnostic algorithms.

3.6.4. 3di

The 3di (Skuse et al., 2004) has unique value in the assessment of autistic traits, as it is the first standardised computerised measure to assess autistic features dimensionally. It was designed for use with both clinical and general population samples. The 3di (Skuse et al., 2004) measures both symptom intensity and comorbidity across the full range of the autistic spectrum by parental report. Furthermore, the 3di does not require secondary data entry thus reducing measurement error. Additionally, respondent bias is reduced through the design of the interview where complex questions are broken down and scattered throughout the interview. Teacher data are required for diagnostic purposes in the interests of examining consistency of behaviour across contexts essential to the assessment of autistic traits.

The 3di (Skuse et al., 2004) comprises of 183 questions relating to demography, family background, developmental history and motor skills which were all asked in the current study. This included some questions screening for attachment problems. There are 266 questions concerned with disorders on the autistic spectrum. A further 291 questions

relate to other psychiatric diagnoses (ICD-10: WHO, 1993). Of these, only questions pertaining to Hyperkinetic Disorder and CDs were asked.

Responses are generally coded on a three point scale covering: absence of behaviour; minimal evidence of behaviour; and definite or persistent evidence of behaviour. Algorithms provide output in terms of five PDD dimensions (Reciprocal Social Interaction Skills; Social Expressiveness; Use of Language and Other Communication Skills; Use of Gesture and Non-verbal Play; and Repetitive or Stereotyped behaviours and Routines). Diagnostic caseness is based exclusively on information from parent and teacher report. Diagnoses are generated according to ICD-10 (WHO: 1993) criteria to cover: Childhood Autism; Asperger's Syndrome; Atypical Autism; PDD unspecified; and other childhood psychiatric diagnoses.

The 3di (Skuse et al., 2004) has been extensively tested with both normal and clinical populations yielding excellent validity and reliability. Test-retest and inter-rater reliabilities were excellent with most intraclass correlations coefficients greater than .9 (Skuse et al., 2004). Concurrent validity assessed by agreement with independent clinician diagnosis was very good ($k = 0.74$). Criterion validity using the Autism Diagnostic Interview (ADI-R: Lord et al., 1994) was also good with 65% agreement on case status (Skuse et al., 2004). It is noted that the 3di is more conservative than the ADI-R for reciprocal social interaction, which may be due to the relative greater focus on current behaviour in the 3di. Finally, discrimination between ASD and non-autistic children was excellent (sensitivity 1.0; specificity > 0.97). The researcher (RD) was

trained in the administration of the 3di and approved for inter-rater reliability by the Brain and Behavioural Sciences Unit, Institute of Child Health.

3di questionnaires were sent to families who had agreed to participate. Questionnaire data included background information on family members, as well as detailed information on the child's developmental history (see Appendix E for pre-entry questionnaire). The hyperkinetic behaviour questionnaire (see Appendix F), the conduct problems questionnaire (see Appendix G), and the CCC (Bishop, 1998) were filled in by both parent and teachers. Both teacher and parent report were required as consistency between informants is essential to the assessment of autistic traits (e.g., Skuse et al., 2004). All questionnaire data were entered into the 3di program before the face-to-face interview was carried out.

3.7. Equipment

The 3di (Skuse et al., 2004) program runs on Microsoft Access and was installed onto a Compaq laptop.

3.8. Procedure

Initially the researchers (RD & GP) approached the schools and the pupil referral unit explaining the study and what would be involved. This included presentations at staff meetings. The first phase of recruitment involved teachers identifying excluded or at-risk-of-exclusion children and passing on information packs with response slips to

families. Interested families filled out the response slips with their contact details. The personal details were only known to the researchers when families expressed an interest in taking part. Please see Figure 1 for recruitment flow chart.

The second phase of recruitment involved teachers selecting comparison children attempting to balance group-wise on gender, age, general ability and ethnicity. To boost recruitment of comparison children the researchers distributed information packs to parents at the end of the school day. Interested families were contacted by telephone to answer any questions on the research, check eligibility for the study and to arrange a meeting.

Once families agreed to participate, appointments were usually arranged at home, with some taking place in the local schools. Questionnaires were sent out to the families and data entered into the laptop prior to the home visit. Response rates were variable, possibly influenced by parental literacy. Questionnaire responses were checked at interview for consistency and administered orally when required. Permission to contact the school was requested, and questionnaires sent out to class teachers, or in some cases to learning support assistants where they knew the child better. Reminder phone calls were made and letters sent to confirm home visits. The parental interview took on average two hours, after which each family received an individualised report. Two copies of the assessment report were sent to the families so that they could give a copy to the school if they wished. Where appropriate these included recommendations or referrals to local child and family services, or to the Social Communication Disorders

Clinic at Great Ormond Street Hospital. Finally a prize draw of Argos vouchers was run, to thank the families for their time spent participating in the project.

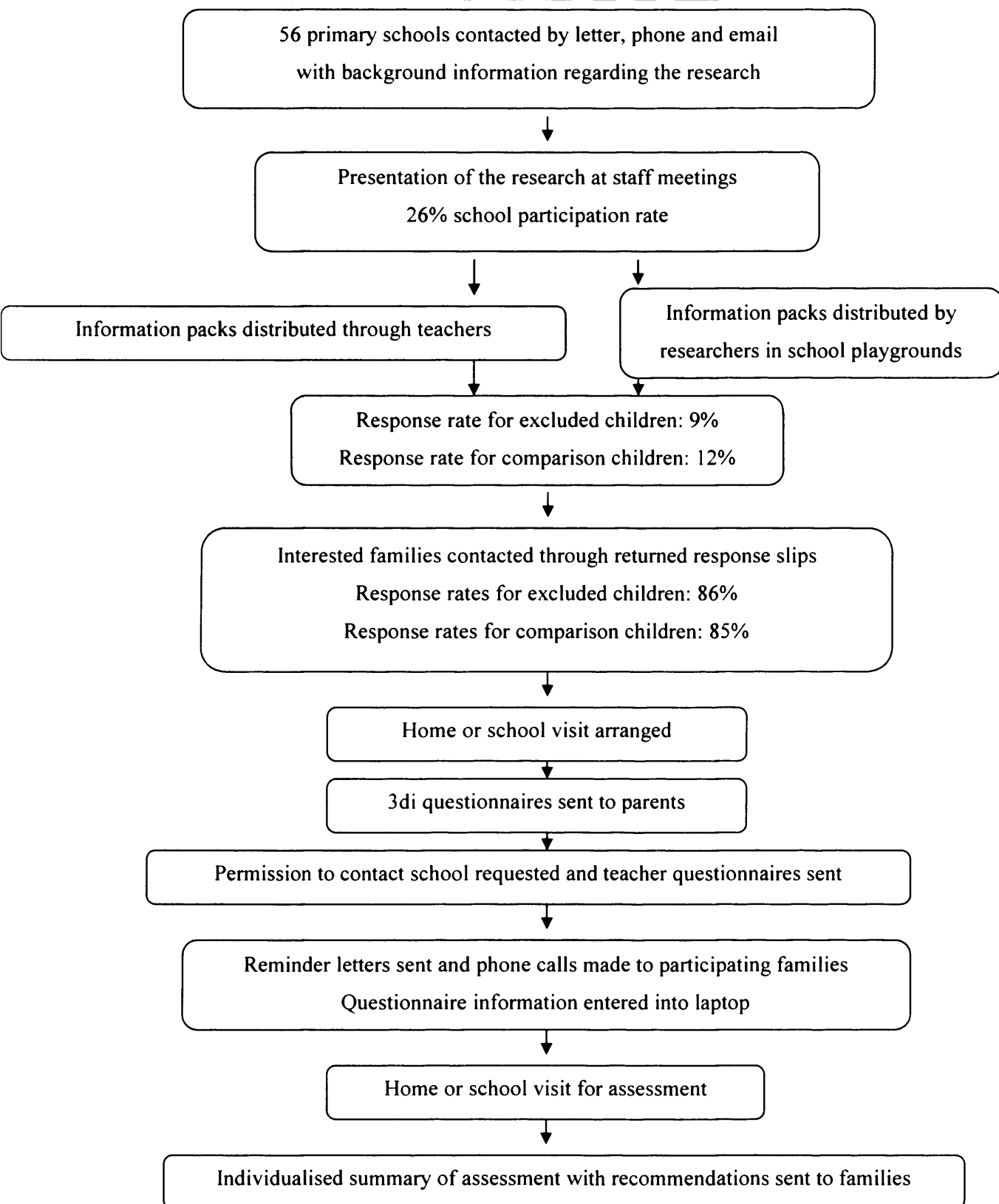


Figure 1: Recruitment flow chart.

4.0. Results

4.1. Overview

The results section is divided into five parts. The first addresses data screening issues. The second section presents descriptive and inferential statistics for developmental information from the 3di (Skuse et al., 2004). This is followed by parent and teacher data for the CCC (Bishop, 1998). Mean and standard deviation are reported for the CCC subscales with percentage in clinical range, defined as 3 standard deviations from the population mean (Bishop & Baird, 2001). The fourth section reports the mean, standard deviation, and percentage in clinical range for the five 3di PDD dimensions. The fifth section reports the percentages reaching criteria for PDD, CD, and Hyperkinetic Disorder diagnoses according to ICD-10 (WHO; 1993). The final section reports on the association between PDD and CD diagnoses. Descriptive statistics are reported for the excluded sub sample who meet criteria for a PDD.

4.2. Data Screening

The data were inspected for normality and outliers before any analysis was carried out. There was skewness and kurtosis on all CCC (Bishop, 1998) subscales for parent and teacher report for the comparison group. The 3di (Skuse et al., 2004) dimension for stereotyped and repetitive behaviours and the hyperkinesis subscales also showed some skewness and kurtosis for the comparison sample. This is as expected given that these measures were designed to discriminate between clinical and sub-clinical impairment.

Statistical transformations were not carried out, as the data are in meaningful units on established scales which, importantly enables comparison with previous studies (Norma & Streiner, 2000). Where there were concerns about non-normal distribution, equivalent non-parametric tests were performed with significant effects reported only where these agreed with the parametric tests.

The excluded and comparison group were balanced for age, gender, VIQ, ethnicity, English as an additional language, social housing and single parent status (see Tables 1-3). However, an independent *t*-test revealed a significantly higher PIQ in the comparison group $t(46) = -3.32, p = .01$. Given that FSIQ is a composite score derived from VIQ and PIQ, VIQ and PIQ are reported henceforth. PIQ was controlled in subsequent analyses. Furthermore, chi squared tests showed significantly higher levels of parental education, $\chi^2(2, N = 48) = 16.62, p = .001$, in the comparison group and higher rates of parental employment in the comparison group, $\chi^2(2, N = 48) = 8.09, p = .02$. Whilst parental education should correlate highly with being employed and the level of skill required, migration has meant loss of employment status for several families in the sample. Due to the small sample size, it is not meaningful to categorise according to occupation type. Parental education was therefore controlled in subsequent analyses.

One participant in the excluded group was identified as an outlier with regard to PIQ ($z = 3.29$). Boxplots identified him as an outlier, but not as an extreme outlier. Deleting him from the analysis did not remove the group difference on PIQ. This participant was

not removed from the dataset on the grounds that between-group differences on the measures were retained when he was excluded from the analyses.

Significant results are only reported when effects remain after PIQ and parental education were controlled. Moreover, appropriately stringent p levels were used for statistical significance when multiple tests were carried out on a given measure to control for type I error. All tests were hypothesis-driven planned comparisons.

There were some missing data for the 3di (Skuse et al., 2004) regarding early development. The *not known* response was chosen in these instances, or normative data substituted. Furthermore, teacher CCC data (Bishop, 1998) were missing for one excluded and one comparison child.

4.3. 3di: Early Development Information

This aspect of the study was predominantly descriptive with no specific differences hypothesised. Chi squared tests were performed on discrete data. Analyses revealed no significant group differences for prenatal exposure to cigarette smoke, $\chi^2(1, N = 48) = 2.35, p = .13$, or prenatal exposure to alcohol, $\chi^2(1, N = 48) = 3.29, p = .07$. Notably class A drug use during pregnancy was greater for excluded than comparison children, reaching marginal significance, $\chi^2(1, N = 48) = 3.69, p = .06$. Moreover, comparison children showed significantly more unplanned caesarean sections than the excluded group, $\chi^2(1, N = 48) = 5.25, p = .02$.

There were no between-group differences in terms of milestones for sitting, $t(45) = 0.60$, $p = .55$, moving independently, $t(45) = -0.69$, $p = .50$, or walking, $t(45) = -0.54$, $p = .96$. Similarly there was no group difference in terms of language development $\chi^2(1, N = 48) = 0.88$, $p = .77$. Mean age of first concern regarding the child's development for excluded children was 5.15 years, $SD = 2.56$.

Parents described the following behaviours of concern for excluded children: verbal and physical aggressiveness, e.g. difficulty controlling temper; defiance; difficulty accepting authority and obeying rules; difficulty getting along with peers; and difficulty communicating their needs.

There were no significant between-group differences in terms of biological functions which included hearing, $\chi^2(1, N = 48) = .67$, $p = .41$, sensitivity to sounds, $\chi^2(3, N = 48) = 6.96$, $p = .07$, early feeding problems (none reported across the whole sample), current eating problems, $\chi^2(1, N = 48) = 0.48$, $p = .83$, and toileting, $\chi^2(1, N = 48) = 2.49$, $p = .12$. Whilst faecal smearing did not reach statistical significance, $\chi^2(1, N = 48) = 2.71$, $p = .10$, three excluded, versus no comparison, children engaged in this activity. Whilst there were no significant between-group differences for early sleeping problems, $\chi^2(1, N = 48) = 0.76$, $p = .38$, there were significantly greater current sleeping problems in the excluded group, $\chi^2(1, N = 48) = 6.93$, $p = .001$, however this effect became non-significant when parental education was controlled.

Questions screening for attachment problems revealed no significant between-group difference, $\chi^2(1, N = 48) = 2.71, p = .10$. In contrast, age appropriate social behaviour was significantly poorer for excluded than comparison children, $\chi^2(1, N = 48) = 8.12, p = .001$. This included being rude to strangers, not understanding what to do or say in social situations, and being unable to remain seated when the social situation demands it. Significantly more excluded than comparison children were on the special educational needs register for emotional or behaviour problems, $\chi^2(3, N = 48) = 27.37, p = .001$. Additionally, significantly more excluded than comparison children received academic support, $\chi^2(1, N = 48) = 8.73, p = .001$, however this effect became non-significant when parental education and PIQ were controlled.

4.4. CCC Data: Parent and Teacher Report

It was hypothesised that a higher proportion of excluded than comparison children would fall into the clinical range on the CCC (Bishop, 1998), particularly on the subscales that combine to form the pragmatic composite, and on those that describe autistic traits. Table 4 shows the mean and standard deviation for the CCC (Bishop, 1998) subscales and pragmatic composite in addition to the percentage in the clinical range for both groups. These data substantially support the hypothesis with significantly more excluded than comparison children in the clinical range for the pragmatic composite score and for the social relationships subscale associated with autistic traits. No significant between-group differences were observed for the intelligibility / fluency and syntax subscales measuring structural aspects of language.

Table 4: Parent CCC Data for Excluded and Comparison Children

CCC scale	Group	
	Excluded (N = 26)	Comparison (N = 22)
Intelligibility / fluency <i>M (SD)</i>	33.38 (4.73)	34.73 (1.75)
% in clinical range (n)	23(6)	0(0)
Syntax <i>M (SD)</i>	30.58 (1.58)	31.45(0.86)
% in clinical range (n)	19(5)	0(0)
Inappropriate initiation <i>M (SD)*</i>	24.15 (2.54)	27.77 (2.58)
% in clinical range (n)	8(2)	5(1)
Coherence <i>M (SD)*</i>	31.35 (2.86)	34.91 (1.41)
% in clinical <i>M (n)*</i>	50(13)	0(0)
Stereotyped Language <i>M (SD)</i>	24.69 (2.92)	27.45 (2.70)
% in clinical range (n)	12(3)	5(1)
Use of Context <i>M (SD)*</i>	25.38 (2.94)	30.55 (1.50)
% in clinical range (n) *	50(13)	0(0)
Rapport <i>M (SD)*</i>	29.12 (3.15)	33.20 (1.32)
% in clinical range (n)	31(8)	0(0)
Social Relationships <i>M (SD)*</i>	27.69 (3.67)	33.00 (1.20)
% in clinical range (n)*	46(12)	0(0)
Interests <i>M (SD)</i>	30.69 (3.72)	32.23 (1.93)
% in clinical range (n)	12(3)	0(0)
Pragmatic Composite <i>M (SD)*</i>	134.69 (10.24)	153.86 (7.13)
% in clinical range (n)*	42(11)	0(0)

* significant at $p < .001$ (for at least 3 *SD* from the typically developing mean).

No significant differences were observed between parent and teacher ratings on the CCC (Bishop, 1998) subscales, or on the pragmatic composite for both mean and percentage in clinical range ($p < .01$). See Table 10 Appendix H for teacher CCC. Furthermore, the parent and teacher CCC pragmatic composite scores were highly correlated ($r = .45$, $N = 46$, $p < .01$). Please see Figures 2 and 3 (Appendix I) for the distribution of parent and teacher clinical range CCC pragmatic composite scores across the whole sample. These show that only a few children scored below 120 for the pragmatic composite, with most children in the clinical range scoring between 120 and 132.

Parent data are presented as they correlated more closely with clinical diagnosis than teacher data (Bishop & Baird, 2001; Gilmour et al., 2004). A logistical regression showed a significant independent effect of parent CCC pragmatic composite on meeting criteria for a PDD, $Wald(1) = 3.97$, $N = 48$, $p < .05$. In contrast, the independent effect of teacher CCC pragmatic composite was non-significant, $Wald(1) = .65$, $N = 48$, $p = .42$.

Given the non-significant between-group difference for English as an additional language, $\chi^2(1, N = 48) = 1.50$, $p = .21$, this was correlated with the parent and teacher CCC pragmatic composite across the whole sample. Neither parent CCC pragmatic composite, $r = -.114$, $N = 48$, $p = .44$, nor teacher CCC pragmatic composite were significantly correlated with English as an additional language, $r = -.08$, $N = 46$, $p = .60$.

4.5. 3di Dimensions and Diagnoses

4.5.1. PDD dimensions

It was predicted that a higher proportion of excluded than comparison children would show clinically significant impairment for the 3di PDD dimensions (Skuse et al., 2004). Table 5 shows the mean and standard deviation for the 3di PDD dimensions for both groups. Please see Figures 4 to 8 (Appendix J) for dot graphs showing the distribution of scores in the clinical range for the 3di dimensions across the whole sample .

Table 5: 3di PDD Dimensions Grouped Under the Autistic Triad

3di Dimension	Excluded (N= 26)	Comparison (N = 22)
<i>Reciprocal Social Interaction</i>		
Reciprocal social interaction skills $M(SD)^*$	8.64 (2.89)	4.22 (1.52)
% in clinical range (n)*	35 (9)	0 (0)
Social expressiveness $M(SD)^*$	1.43 (0.58)	0.83 (0.43)
% in clinical range (n)*	85 (22)	36 (8)
<i>Communication</i>		
Language & other social communication skills $M(SD)^*$	8.92 (3.87)	4.36 (1.75)
% in clinical range (n)*	58 (15)	5 (1)
Gesture & non-verbal play $M(SD)^*$	4.15 (2.69)	2.32 (1.75)
% in clinical range (n)	12 (3)	5 (1)
<i>Restricted, Repetitive & Stereotyped Behaviour & Activities</i>		
Repetitive or Stereotyped behaviours and routines $M(SD)$	0.85 (1.14)	0.31 (0.55)
% in clinical range (n)	8 (2)	0 (0)

* significant at $p < .01$.

4.5.2. PDD diagnoses

It was hypothesised that significantly more excluded than comparison children would meet criteria for a PDD. Diagnostic caseness was based exclusively on parent and teacher report from the 3di (Skuse et al., 2004). The 3di generates diagnoses according to ICD-10 (WHO: 1993) criteria to cover: Childhood Autism; Asperger's Syndrome; Atypical Autism; PDD unspecified; and other childhood psychiatric diagnoses. Table 6 shows the numbers of children meeting diagnosis for PDDs in both groups.

Table 6: PDDs for Excluded and Comparison Children

Pervasive developmental disorder	Excluded (N= 26)	Sex M:F	Comparison (N=22)
Asperger's Syndrome % (n)	8 (2)	2:0	0 (0)
Atypical Autism % (n)	12 (3)	3:0	0 (0)
Pervasive developmental disorder, unspecified % (n)	15 (4)	3:1	0 (0)
Total % (n)*	35 (9)	8:1	0 (0)

* significant at $p < .01$.

4.5.3. Conduct disorder diagnoses

A larger proportion of excluded than comparison children were expected to reach criteria for a diagnosis of CD. Table 7 shows CD diagnoses for both groups.

Table 7: Conduct Diagnoses for Excluded and Comparison Children

Conduct disorder diagnoses	Excluded (N = 25)	Comparison (N = 21)
Unsocialised conduct disorder % (n)	40 (10)	0 (0)
Socialised conduct disorder % (n)	8 (2)	0 (0)
Conduct disorder confined to family context % (n)	12 (3)	0 (0)
Oppositional defiant disorder % (n)	12 (3)	0 (0)
Any conduct disorder % (n)	72 (18)	0 (0)

Note. No significant independent effects for group after parental education and PIQ are controlled, also no significant independent effects for parental education and PIQ.

4.5.4. Hyperkinetic disorder diagnosis

It was hypothesised that more excluded than comparison children would show hyperactive, inattentive and impulsive behaviours. Table 8 shows the means and standard deviations for Hyperkinetic Disorder subscales for both groups.

Table 8: *Hyperkinetic Disorder Subscales and Diagnosis*

Hyperkinesis	Excluded (N= 25)	Comparison (N= 21)
Inattention at home <i>M (SD)*</i>	2.76 (1.54)	0.29 (0.56)
Hyperactivity at home <i>M (SD)*</i>	2.36 (1.34)	0.24 (0.63)
Impulsivity at home <i>M (SD)</i>	0.80 (0.91)	0.29 (0.56)
Inattention at school <i>M (SD)</i>	3.52 (3.11)	0.95 (2.36)
Hyperactivity at school <i>M (SD)*</i>	2.16 (2.29)	0.33 (0.80)
Impulsivity at school <i>M (SD)*</i>	1.88 (1.79)	0.14 (0.48)
Hyperkinetic disorder diagnosis % (n)	8 (2)	0 (0)

* significant at $p < .01$.

4.5.5. PDD Excluded Subgroup: Descriptive Statistics

An association between conduct disordered behaviour and social communication was predicted. All excluded children meeting criteria for a PDD also met criteria for a CD. Having a PDD correlated positively with having a CD diagnosis ($r = .62$, $N = 48$, $p < .01$). Meeting criteria for a PDD also correlated with meeting criteria for a diagnosis of unsocialised conduct disorder ($r = .41$, $N = 48$, $p < .01$). Only two excluded children met criteria for Hyperkinetic Disorder, one of whom also met criteria for a PDD. Please see Figures 9 to 13 (Appendix K) for the distribution of 3di PDD dimensions for children meeting criteria for a PDD diagnoses. Of particular note are Figures 12 and 13, which show the large proportion of sub-clinical scores for the *Gesture and Non-verbal Play* and *Repetitive or Stereotyped Behaviour* 3di PDD dimensions.

Parent and teacher report described the behaviours of concern as defiance, physical and verbal aggression, and difficulty getting on with other children. On account of the small sample size for children meeting criteria for a PDD ($n = 9$), descriptive statistics are reported (see Table 9) with reference to the rest of the excluded group who did not meet criteria for a PDD ($n = 17$).

Table 9 Descriptive Statistics for Excluded children With and Without a PDD

Descriptor	Excluded children with a PDD (n= 9)	Excluded children with no PDD (n= 17)
Age, <i>M</i> (<i>SD</i>)	10.31 (1.73)	8.62 (1.61)
Sex M:F	8:1	15:2
Ethnicity: Afro-Caribbean	44 (4)	65 (11)
White	44 (4)	35 (6)
Indian/Pakistani/Bangladeshi	11 (1)	0 (0)
English as additional language % (n)	0 (0)	24 (4)
Informant : parent % (n)	73 (19)	100 (22)
other family member % (n)	27 (7)	0 (0)
IQ* VIQ, <i>M</i> (<i>SD</i>)	106.11(18.67)	94.0 (13.90)
PIQ, <i>M</i> (<i>SD</i>)	98.22 (18.28)	86.00 (8.88)
Prenatal exposure to: smoke % (n)	56 (5)	53 (9)
alcohol % (n)	33 (3)	18 (3)
class A drugs % (n)	11 (1)	18 (3)
Early concerns: age of first concern, <i>M</i> (<i>SD</i>)	4.78 (2.39)	5.38 (2.74)
faecal smearing % (n)	22 (2)	6 (1)
attachment problems % (n)	22(2)	6 (1)
Socio-economic variables		
Parents unemployed % (n)	66 (6)	41 (7)
Parental education: 16 years or less % (n)	78 (7)	76 (13)
further education % (n)	11 (1)	18 (3)
university % (n)	11 (1)	6 (1)
Social housing % (n)	89 (8)	76 (13)
Single parent % (n)	56 (5)	59 (10)
Services		
Social service contact % (n)	78 (7)	76 (13)
Child protection concern % (n)	56 (5)	59 (10)
Child and family services contact % (n)	44 (4)	41 (7)
Education		
Fixed term exclusion	66 (6)	18 (3)
Permanent exclusion	22 (2)	29 (5)
Special educational needs		
Statement	33 (3)	24 (4)
School action /action plus	66 (6)	65 (11)
No provision	0 (0)	12 (2)
Academic support	66 (6)	65 (11)

Note. * Outlier included in PDD sample accounts for IQ differences between PDD and non-PDD excluded sub groups.

5.0. Discussion

5.1. Overview of Results

The current study has replicated the Gilmour et al. (2004) findings of significant, previously unidentified, pragmatic deficits in excluded and at-risk-of-exclusion primary school children. In addition more than a third of excluded children in the current study, contrasted with none in the comparison group, met criteria for a PDD based on the 3di (Skuse et al., 2004). This is consistent with the proportion of conduct disordered children who showed clinical impairment on two of the three domains of the autism triad (Gilmour et al., 2004). These significant between-group differences in the current study were independent of group differences in parental education and PIQ.

5.2. Behaviours of Concern

Behaviours of concern identified by teachers for children in the excluded group were: verbal and physical aggressiveness; difficulty controlling temper; defiance; impulsivity; and persistent disruptive behaviour. Similar behaviours were reported by parents with the addition of difficulty in communicating needs. As expected, parental report on the 3di (Skuse et al., 2004) showed significantly poorer age-appropriate behaviour for excluded compared to comparison children. Descriptions of problem behaviours are congruent with those previously reported for exclusion (DfES November, 2001; Gilmour et al., 2004; Ripley & Yuill, 2005).

As expected, significantly more excluded than comparison children were on the special educational needs program for emotional or behavioural problems, and significantly more had academic difficulties. Additionally, more excluded children had come to the attention of child mental health and social services. This is consistent with the educational literature reporting an association between special educational needs and exclusion (DfES, 2003).

5.3. Early Development

In the interests of characterising this rarely studied group, developmental information was collected. Our data showed few group differences. Of note was greater prenatal exposure to drugs in the excluded group. Those prenatally exposed to drugs were all also exposed to cigarette smoke and or alcohol, which has been associated with increased risk of hyperactive and conduct disordered behaviours, even after socio-economic status is controlled (e.g., Button, Thapar & McGuffin, 2005; Taylor & Rogers, 2004). Prenatal exposure to drugs has been associated with a high rate of spontaneous abortions and foetal growth retardation (Taylor & Rogers, 2004). Research in this area is however complicated by inaccuracies in maternal reporting, and the difficulty of disentangling independent effects from the contextual psychosocial factors associated with drug use.

Whilst the influence of prenatal exposure to substances is acknowledged, only one child meeting criteria for a PDD was exposed to drugs. Interestingly, faecal smearing was reported for two of the excluded children meeting criteria for a PDD. Whilst this area

has attracted limited research interest, faecal smearing has been associated with emotional abuse (e.g., Stower, 2000).

Whilst there were no significant between-group differences with regard to developmental milestones, attachment problems or biological functions, two children meeting criteria for a PDD showed some attachment problems. The influence of insecure attachment on social communication skills in these children was considered. Given that the 3di (Skuse et al., 2004) includes only four questions screening for attachment problems, more thorough assessment would be required to determine attachment status. Whilst some children with ASD are expected to show attachment insecurity, the literature suggests this is no more frequent than for typically developing children, and therefore cannot adequately account for social communication difficulties (Rutgers, Bikermann-Kranenburg, van Ijzendoorn & van Berckelaer, 2004).

Mean age of first concern for excluded children was around 5 years which is pertinent as early conduct problems are a strong risk factor for life-course persistent CD (Moffit, et al., 2001) and poor occupational, educational, health and social outcomes (Kazdin, 1995; Rutter, 2004).

5.4. CCC Data

It was predicted that more excluded than comparison children would score in the clinical range for the CCC subscales (Bishop, 1998) that form the pragmatic composite, and for those describing autistic features. These hypotheses were substantially supported. There

were no between-group differences for the two scales measuring the more structural aspects of language: *Intelligibility and Fluency*; and *Syntax*. Of the five scales forming the pragmatic composite, significant differences were found for *Coherence* and *Use of Context*. Mean differences were also found for *Inappropriate Initiation* and *Rapport*. Notably no group differences were found for *Stereotyped Language*. With regard to the two subscales measuring autistic features, significantly more excluded than comparison children reached clinical cut-off for *Social Relationships*, but not for *Interests*. The pragmatic composite group differences strongly support the hypotheses, with 42% of the excluded group falling in the clinical range, contrasted with none in the comparison group.

Excluded children typically have difficulty getting along with their peers, which could be equally accounted for by a CD or an ASD presentation. However, differential questions in the 3di (Skuse et al., 2004), in addition to the CCC scores (Bishop, 1998) support the proposed primary social communication deficit.

The CCC (Bishop, 1998) data in the current study showed good parent-teacher agreement. As in previous studies (Bishop & Baird, 2001; Geurts et al., 2004; Gilmour et al., 2004) parent pragmatic composite scores were more closely associated with clinical diagnosis than teacher ratings. Mean pragmatic composite scores in our study are comparable to those reported in the Gilmour et al. (2004) study. The smaller proportion of children reaching clinical cut-off on the CCC in the current study can be explained by the more controlled design, and the use of more conservative clinical cut-

offs. Furthermore, the current study found somewhat higher ratings (indicative of less impairment) for children with CD and children meeting criteria for a PDD (Bishop & Baird, 2001; Gilmour et al., 2004). This may be partly accounted for by the considerably smaller sample size in the current study. Finally, the CCC pragmatic composite scores for comparison children in the current study showed good agreement with scores reported for typically developing children (Bishop & Baird, 2001; Geurts et al. 2004; Gilmour et al., 2004).

5.5. 3di Data

In support of our hypotheses, a striking 35% ($n = 9$) of the excluded group met criteria for a PDD all of which also met criteria for a CD. Furthermore, the significant independent effect of unsocialised CD on meeting criteria for a PDD supports the proposed under-detection of ASD in excluded children.

In line with the hypotheses, significant mean group differences were found on the following 3di (Skuse et al., 2004) PDD dimensions: *Reciprocal Social Interaction*; *Social Expressiveness*; *Language and Other Social Communication Skills*; *Gesture and Non-verbal Play*. Significant group differences for percentage in the clinical range were found for the first three PDD dimensions. Interestingly, the non-significant group differences for the CCC (Bishop, 1998) subscale *Stereotyped Language* are reflected in the 3di where no group difference was found for *Stereotyped or Repetitive Behaviours*. In terms of the autistic triad of impairment, more excluded children showed impairment in the first two domains of *Reciprocal Social Interaction* and *Language and Other*

Social Communication Skills, but not in the third domain – that of *Stereotyped or Repetitive Behaviours*.

By definition stereotyped or repetitive behaviours were present at clinical levels for the two children meeting criteria for Asperger's Syndrome. With regard to the remaining children meeting criteria for a PDD, sub-clinical levels of stereotyped or repetitive behaviours were reported in all but one case. It is possible that the 3di (Skuse et al., 2004) may be insufficiently sensitive to detect these behavioural traits. A further explanation may be that social communication deficits, in the absence of stereotypy and repetitive behaviours, are characteristic of a proportion of our excluded sample. The latter may be compatible with the proposed continuous distribution of social reciprocity and communication skills in the general population (Charman, 2002; Towbin et al., 2005).

The current study therefore appears to have identified children who have a less severe and less prototypic form of ASD, evident in that three quarters of the PDD diagnoses assigned were either Atypical Autism or PDD unspecified. PDD-NOS (DSM-IV: APA, 1994) or PDD unspecified (ICD-10: WHO, 1993) are categorisations used for children who have general difficulties pertaining to the triad of impairment, but who fail to meet diagnostic criteria for a specific PDD. *Atypical Autism* is used for those who do not meet the diagnostic criteria for Autistic Disorder or Childhood Autism due to late age of onset, atypical or sub threshold symptomatology. For the purposes of this discussion these are considered as equivalent.

5.5.1. Stereotyped and repetitive behaviour

The stereotyped behaviour and repetitive interests component of the autistic triad of impairment includes: stereotyped motor mannerisms; pre-occupation with non-functional objects; circumscribed interests; and extreme rigidity or insistence on sameness (DSM-IV: APA, 1994; ICD-10: WHO, 1993). Even though restricted, repetitive behaviours and interests form a core domain for the triad of impairment, our understanding is still limited (Szatmari et al., 2006).

Lower level behaviours, characterised by repetitive movements are non-specific to autism, as they have also been observed in typically developing young children, and in people with learning disabilities (Militeri, Bravaccio, Falco, Fico & Palermon, 2002). Interestingly, while stereotyped movements in non-autistic individuals were inversely related to IQ, no such relationship was found in autism (Bodfish, Symons, Parker & Lewis, 2000). A recent factor analytic study on individuals with ASD functioning in the normal range of intelligence found that the restricted, repetitive behaviours and interest domain is composed of two factors: *insistence on sameness* and *repetitive sensory and motor behaviours* (Szatmari et al., 2006). Lower functioning individuals tended to show more repetitive and sensory motor behaviours, whereas insistence on sameness was positively correlated with symptoms associated with communication and language impairment (Szatmari et al., 2006).

There is also potential overlap for ASD with Obsessive Compulsive Disorder in terms of higher level, more cognitively complex routines and rituals (Russell, Mataix, Anson,

Declan & Murphy, 2005). Moreover, there is no straightforward relationship between age and higher level repetitive behaviours (Turner, 1999). A different developmental course for circumscribed interests compared to other repetitive and stereotyped behaviours has also been proposed (e.g., South, Ozonoff & McMahon, 2005). In summary, a wide range of repetitive behaviour including both lower and higher level behaviours has been documented in children with ASD functioning in the normal range for intelligence (South, Ozonoff & McMahon, 2005).

5.5.2. Stereotyped behaviour and PDDs

PDD-NOS is at least twice as prevalent as autism (Chakrabarti & Fombonne, 2001). There are few studies comparing children with PDD-NOS to those with ASD, and sample sizes have typically been small. However fewer stereotyped and repetitive behaviours have consistently been found for children with PDD-NOS compared to those with autism or Asperger's Syndrome (Allen et al., 2001; Walker et al., 2004). This is further supported by the recent factor analytic study of restricted, repetitive behaviour and interests where low scores on both of the identified factors i.e., on insistence to sameness and on repetitive sensory and motor behaviours were reported for individuals with Atypical autism (Szatmari et al., 2006). In the Walker et al. (2004) study subgroups for PDD-NOS were analysed. The most strongly represented were high functioning children with transient or persistent language delay, who showed few repetitive or stereotyped behaviours. Whilst none of the children assigned to a PDD diagnosis in the current study showed language delay, they were all functioning in the

normal range of intelligence with three quarters showing sub-clinical levels of stereotyped or repetitive behaviours.

Tanguay, Robertson and Derrick (1998) found that the symptoms listed under repetitive and stereotyped behaviours for DSM-IV (APA: 1994) did not correlate well with the social communication domains assessed through the ADI-R (Lord et al., 1994) and the Autism Diagnostic Observation Schedule (ADOS: Lord et al., 1989). They therefore argue that, whilst current diagnostic classification systems are well suited to the identification of classic autism, they may be inadequate for the diagnosis of less prototypic forms.

5.5.3. Hyperkinetic disorder

Whilst the data showed no significant group differences for a diagnosis of Hyperkinetic Disorder, significant group differences were found on most of the hyperkinesis subscales with excluded children showing a greater number of symptoms than comparison children. This is congruent with the reporting of such behaviours as contributory reasons for exclusion (DfSE January, 2001; Gilmour et al., 2004; Ripley & Yuill, 2005).

The influence of hyperkinetic symptoms on social communication was considered. There is evidence to suggest some overlap on CCC (Bishop, 1998) scores for children with ADHD and for children with ASD, although children with ASD may show more profound deficits (Bishop & Baird, 2001; Geurts et al., 2004). Pragmatic problems can

be explained by a deficit in executive function, which may constitute a shared influence for autism and ADHD (Geurts et al., 2004). Given that there were only two excluded children meeting criteria for Hyperkinetic Disorder (ICD-10; WHO, 1993), the effect of these symptoms on depressing CCC (Bishop, 1998) pragmatic scores should be minimal.

5.6. Limitations

5.6.1. Sample

It could be argued that children with the most problematic behaviours, from the most unsettled socio-economic backgrounds did not choose to participate in the current study. However, almost a third of the excluded sample were recruited from the pupil referral unit indicative of severely disrupted behaviour. To this the current political climate of inclusion is noted where permanent exclusions from primary school are rare (DfES, 2004). The large proportion of excluded children meeting diagnostic criteria for CD further supports the severity of impairment in this sample.

It is possible that a selection bias was introduced by teachers identifying children with social communication difficulties, as they were aware of the hypotheses of the study. However, teachers were instructed to identify children whose behaviour posed management difficulties. Furthermore, awareness and opportunities for training on ASD for teaching staff is often limited (NAS, 2001). Whilst it was not my impression that teachers were selecting children whom they believed had social communication problems, it remains a theoretical possibility. The rates of difficulty identified in this

study were nonetheless very high. According to the least conservative prevalence rates (Chakrabarti & Fombonne, 2001), 1500 children in the general population would have needed to have been assessed to identify nine children with ASD.

5.6.2 .PIQ and Parental Education

Whilst the groups were well balanced on age, gender, VIQ, ethnicity, English as an additional language, social housing and single parent status they were not balanced on parental education or PIQ. Significant group difference was only reported if it remained once parental educational and PIQ were controlled.

Whilst there is support for an association between low socio-economic status and vocabulary (e.g., Farkas & Beron, 2004), there is no literature reporting an association between low socio-economic status and pragmatic language difficulties. Furthermore, the standardisation data for the revised CCC (Bishop, 2003) showed only minimal influence of socio-economic status for the lowest social band (1.7% of the variance) for non-verbal communication which reaches significance only on account of large sample size (D. V. M. Bishop: personal communication, May 5, 2006). Additionally, ASD is reported across all geographical areas, social classes, racial and ethnic groups (Mental Health Foundation, 2001).

5.6.3. *Causality*

The significant positive correlation between meeting criteria for a PDD and a CD in the current study supports the assertion that social communication deficits, of an autistic nature, are undetected in excluded children with conduct problems. The potential role of neurodevelopmental problems in the origin of severe and persistent antisocial behaviour may help account for the preponderance of males (Moffit et al., 2001). Indeed there is high male to female ratio in the current study. The proposed neurodevelopmental influence in terms of ASD does not however minimise, or exclude the role of other influences, such as early adverse social environment.

Theoretically there are reasons to argue for social communication difficulties as the primary deficit with secondary conduct disordered behaviour. Indeed, behavioural markers for CD can be interpreted as stemming from an underlying social communication deficit. Significantly, ICD-10 (WHO, 1993) recognises that CDs can be symptomatic of other disorders. Moreover, CD does not appear for PDDs in the differential diagnosis sections for either of the two major classification systems (DSM-IV: APA, 1994; ICD-10: WHO, 1993). In addition, clinically significant levels of antisocial and disruptive behaviour have been reported in children with ASD after IQ is controlled (Tonge, et al., 1999). Finally, children with ASD have been misclassified or undetected in the community (Towbin et al., 2005).

However, the design of the current study means that no causal inferences can be made. Moreover, it could be argued that the social communication deficits identified in the

current study are merely a trait that phenotypically resembles ASD. Furthermore, diagnostic status was decided on parent and teacher report only. Whilst child observation and assessment data would further strengthen these findings, good agreement for caseness, approximately 70%, between the 3di (Skuse et al., 2004) and the ADOS (Lord et al., 1994) is noted (D. H. Skuse: personal communication, June 16 2006).

5.7. Wider Implications

5.7.1. Clinical and educational implications

The current study showed more frequent rates of exclusion for children meeting criteria for a PDD than for non-PDD excluded children. This is consistent with the relatively higher rates of exclusion reported for children with ASD functioning in the normal range of intelligence compared to their cognitively less able counterparts (NAS, 2000). Exclusion for children with an unidentified ASD is particularly inappropriate and unlikely to be beneficial, with regard to learning from mistakes, as the core social communication deficit is not addressed (National Foundation for Educational Research, 2003). Furthermore, parents of children with ASD reported negative effects associated with delays in the provision of support which included increased behavioural and mental health problems in their children (NAS, 2006).

Whilst children in the excluded group had more contact with health and social services than children in the comparison group, less than half reported contact with child and family services. Indeed, children with CD are underrepresented in the health services

(Office for National Statistics, 2000). To our knowledge none of the children in our study had previously been assessed for pragmatic language or ASD. Children who attended child and family services had been seen for behaviour management and family work.

The current study, along with the Gilmour et al. (2004) findings, underscores the importance of effective community detection of ASD in children presenting with conduct disordered behaviours. However, general population screening for ASD is complicated by: ambiguities in the definition of ASD and its boundaries; insufficient understanding of variation in prevalence rates required for resource planning; inadequate validation of screening tools; and an absence of longitudinal data on screening or interventions (Medical Research Council, 2001; Williams & Brayne, 2006). Whilst screening in mainstream schools is not viable in the UK at this point in time (Williams & Brayne, 2006), screening maybe appropriate for children at-risk-of exclusion (e.g., Childhood Asperger Syndrome Test; Scott, Baron-Cohen, Bolton & Brayne, 2002).

Whilst there is increasing recognition of the importance of interagency working and early intervention (DfES November, 2001), this poses certain practical difficulties. The National Autistic Society reported that only a quarter of children with ASD have a statement of special educational need, and that clinical diagnoses are not consistently recorded on these documents (NAS, 2001). Additionally whilst over two thirds of teachers surveyed by the National Autistic Society reported having worked with children with ASD, only 5% had received specific training as part of their professional training (NAS, 2001). Furthermore, under-detection is also likely within health services.

Towbin, et al. (2005) found that 8% of children in a mood disorders clinic screened positive for ASD children suggesting misclassification. Furthermore, the service provision divide between child mental health services and child development services may further contribute to under-detection in the community.

Whilst there have been few randomised controlled studies into treatment effectiveness for children with ASD, there is some evidence to support gains in social communication and adaptive functioning with early intervention (e.g., Tsatsanis, Foley & Donehower, 2004). Targeted intervention and specialist support could enable more children with ASD, who present with conduct problems, to be educated in a mainstream setting without recourse to exclusion (NAS, 2006). Improving detection of ASD in primary schools would directly contribute to the political aims of inclusion of children with special educational needs. With reference to the current study, further larger-scale research is required to test the generalisability of these findings and to inform policy.

5.7.2. Theoretical or research implications

Whilst dimensional conceptualisation of developmental disorders is more ecologically valid, covering a broad range of severity, the distinction between the edges of a dimensional diagnosis and the edges of normality become blurred (Farmer & Oliver, 2002). Moreover, the distinction between PDDs and specific developmental disorders, such as ADHD is less distinct than previously thought (e.g., Bishop & Norbury, 2002; Towbin et al., 2005). The current study adds to the existing data (Gilmour et al., 2004; Gilchrist et al., 2001) suggesting comorbidity between ASD and CD. Another

implication of this comorbidity concerns screening to exclude ASD in research trials intending to investigate CDs (Towbin et al., 2005).

Children meeting criteria for a PDD-NOS or for Atypical Autism are more prevalent than those meeting criteria for autism (Chakrabarti & Fombonne, 2001). This group constitute a challenge for assessment; indeed inter-rater reliability for diagnosis is less reliable than for autism (Mahoney et al., 1998). At present this category is too heterogeneous. Further research is needed to characterise or subtype this group, so that they may be better understood and catered for in terms of service provision (Walker et al., 2004).

5.8. Conclusion

This is the second study (Gilmour et al., 2004) to show clinically significant pragmatic language deficits in excluded and at-risk-of-exclusion primary school children using the CCC (Bishop, 1998). Moreover, this is the first study to characterise these children in such diagnostic detail. Over a third of the excluded children met criteria for a PDD, as well as meeting criteria for a CD based on parent and teacher report using the 3di (Skuse et al., 2004). Other explanations for these findings are considered in terms of the influence of socio-economic status, executive function and attachment. It is argued that none of these can adequately explain the identified social communication deficits in the excluded sample. The identification of previously undetected pragmatic language difficulties and ASD in this community sample has important clinical and research implications which are discussed.

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PART III

CRITICAL APPRAISAL

1.0. Overview

This critical appraisal is divided into five sections. The first covers methodological issues. This is followed by a discussion on the influence of culture. The third section discusses the role of multiple influences on child development. This is followed by a personal reflection. The critical appraisal ends with a summary of the thesis.

2.0. Methodological Issues

Reflection on the research process as a whole raises certain methodological issues that are worthy of mention. Observations concerning recruitment include considerations for recruitment rate and group differences. Furthermore, it is interesting to reflect on respondent characteristics and the information they are able to provide. Finally, methodological issues pertinent to the wording and associated comprehension of the measure items are discussed.

2.1. Recruitment

Recruitment for hard to reach populations is challenging in terms of engagement. In the current study recruitment for excluded children was easier than for comparison children, as there was concern around their behaviour, which meant that families and teachers were keen for further assessment to take place. Parental level of education was higher for the comparison group than for the excluded group. It is plausible that research is more socially valued by parents with higher levels of education, and that this may have influenced recruitment to the study.

Moreover, one excluded child recruited from the playground was initially erroneously identified as a comparison child. Teacher data later indicated that this child was in fact considered at-risk-of-exclusion, illustrating not only the subjectivity of this community defined category, but also the importance of multi-informant assessment.

The recruitment rate over the year was extremely variable. Whilst the initial response rate, of slips returned, was low (approximately 10%), this rose steeply (approximately 80%) for those who agreed to participate when contacted by telephone. There may be several reasons for this including not all information packs being distributed by schools and poor levels of literacy making written information less accessible to parents. When we suspected insufficient literacy, we made sure another person was present at assessment to read the consent form to the parent. Personal contact with both the families and the schools proved essential to engagement. Furthermore, a few families in both groups knew each other and spoke positively about their experience of having participated in the study. Finally, it is hoped that information on the recruitment process will be of value regarding planning for further larger scale research in this area.

2.2. Parental Interviews

The respondent was usually the mother or female carer, although there were two fathers as sole respondents, and a few joint parental responses. Interestingly, a meta analysis of inter-parental agreement on child behaviour showed moderate correspondence for internalising problems and large correspondence for externalising problems (Duhig, Renk, Epstein & Phares, 2000).

Seven children in the excluded group were not in the care of their biological parents. For these children other informal care arrangements were in place. Most of these children were cared for by their grandparents. Attempts were made to have a biological parent present at the assessment. More frequently a biological parent was consulted by the

main carer prior to the assessment so as to fill in the Developmental, Dimensional and Diagnostic Interview (3di: Skuse et al., 2004) questionnaire on early development. Partial missing data for developmental information was therefore limited to three excluded children.

2.3. Wording for Measures

Deviation from the precise wording for both the Children's Communication Checklist (CCC; Bishop, 1998) and the 3di (Skuse et al., 2004) was, at times, necessary for comprehension. It is noted that the CCC was designed for use with teachers. Educational background may have affected some parents' ability to understand complex vocabulary and constructions, such as double negatives. The utmost care was taken to minimise any effect of deviation from the wording by providing examples to enhance understanding of the original item, and consistently presenting the appropriate response format. When I was unsure that an item had been sufficiently understood, I chose the *not known* or normative response options, so as not to inflate reported social communication deficits. In addition, I am confident that the validity of responses was improved by orally checking contradictory written responses on the CCC during the face to face assessment.

3.0. Cultural Influences

Cultural influences featured in many ways in this study, not least due to the ethnically diverse backgrounds of the participating families, characteristic of local population (Office for National Statistics, Census, 2001). Culture refers to the way of life, including general customs and beliefs, of a particular group of people at a given point in time (Cambridge online dictionary, n.d.). This section considers the role of culture in terms of: differences between the researchers and the families; the over-representation of Afro-Caribbean excluded children; and differences in child rearing practices.

3.1. Differences Between the Researchers and the Families

It is interesting to reflect on the potential influence of differences between us, the researchers (RD & GP), and the participants in our study. The most obvious differences between myself and the parents interviewed concerned socio-demographic background and ethnicity. Whilst I felt I had a good rapport with families, it is possible that these differences may have impacted upon recruitment to the study or on the experience of participating in the research.

3.2. Over-representation of Afro-Caribbean Excluded Children

Almost 60% of the excluded group were of Afro-Caribbean origin. Notwithstanding the high ethnic minority representation in the London Borough where the current study took place (Office for National Statistics, Census, 2001), this figure is disproportionately high. Afro-Caribbean boys are twice as likely as their Caucasian British counterparts to

be categorised as having emotional, behavioural or social difficulty (Bose & Jennings, 2005; Department for Skills and Education [DfSE], 2005). Additionally, they continue to be permanently excluded from schools at a higher than average rate (DfSE, 2005).

It has proved difficult to tease apart the relative influences of socio-economic deprivation and ethnic minority status on exclusion from school, as they are strongly associated with each other (Social Exclusion Unit, 2001). Other explanations include a tendency of teachers to more readily identify Afro-Caribbean boys as disruptive or violent (Bose & Jennings, 2005). To this the under-representation of ethnic minority groups amongst qualified teaching staff is noted (DfES, 2005).

Standards of normative behaviour may vary between cultures. We reflected on the role of cultural differences in terms of what is considered normal or acceptable behaviour in our study. Some parents of excluded children described their child's behaviour as "boisterous" or "energetic". A few parents of excluded children identified with their child's behaviour considering it part of normal development. Interestingly, a father of a child who met criteria for a Pervasive Developmental Disorder (PDD) according to the 3di (Skuse et al., 2004), considered many interview items as accurate descriptions of himself. The genetic influence for Autistic Spectrum Disorder (ASD) and for severe early-onset Conduct Disorder (CD) may partially explain parental identification with a child's difficulties (Medical Research Council, 2001; Moffitt, Caspi, Rutter & Silva, 2001).

Teachers and parents may have different explanatory frameworks for a child's behaviour. This may mean that behaviours considered to be demanding or attention seeking at school may be otherwise explained by the parent, e.g., in terms of shyness or difficulty in appropriately communicating need. Moreover, some differences in the perception of a child's behaviour may be independent of culture reflecting context dependent behaviour. As regards the proposed under-detection of social communication deficits, children may present with conduct problems or mood disturbance as a consequence of the unmanageable social demands experienced in the classroom setting (Towbin, Pradella, Gorrindo, Pine & Leibenluft, 2005).

Whilst behaviour checklists may be valid for use across different cultures, cut-off points should not necessarily be uniform (Crijnen, Aschenbach & Verhulst, 1997). Cultural differences regarding thresholds for behaviour may have affected sample definition in this study with regard to the social construction of conduct disordered behaviour. In contrast, it is not my impression that cultural influences affected the identification of PDD in this study. This impression is supported by the good parent-teacher agreement on the CCC (Bishop, 1998). Moreover, parent pragmatic composite scores on the CCC were more closely associated with a PDD diagnosis than teacher ratings in line with previous studies (Bishop & Baird, 2001; Geurts et al., 2004; Gilmour, Hill, Place & Skuse, 2004). In sum balancing groups for ethnicity is essential in minimising undesired cultural influences that may confound the abilities under study. Finally, it is noteworthy that ASD is reported across all geographical areas, social classes, racial and ethnic groups (Mental Health Foundation, 2001).

3.3. Differences in Child Rearing Practices

It was my impression that there were differences in the importance attached to remembering developmental milestones. Afro-Caribbean families seemed generally less specific about these. Sibling comparison, or comparison to other children in the wider family was useful in this regard.

The absence of toys for children to play with was generally conspicuous, especially in excluded children's homes. Whilst this could be influenced by economic disadvantage, almost all homes had a Play Station, which may reflect values associated with an industrialised culture. Additionally, other ethnic beliefs about the role and type of children's play may exert an influence (Hyun, 1998).

With regard to hyperactive or inattentive behaviours, many children in the study did not live in environments where safe outdoor play was possible. Many of them also lived in single parents homes making supervision of play more difficult. This may lead to increased reliance on television and computer games. Furthermore, unacceptable behaviour at school may be punished by not allowing children outside for break times thereby exacerbating any hyperactive or inattentive behaviours in the classroom.

4.0. Multiple Influences on Child Development

This section considers the role of multiple influences on child development, which include consideration of neurobiological and environmental factors. PDDs are then discussed with reference to the findings of the current study. This is followed by consideration of the possible confounding influence of psychopathy, as another disorder of empathy, on the findings reported in the current study. This section ends with a discussion of the wider implications of the study findings.

4.1. Neurobiological Factors

Assessing children individually meant that we were acutely aware of multiple possible influences on development. Perinatal factors included prenatal exposure to drugs, cigarette smoke, and alcohol which can adversely affect neurological development, increasing the risk of hyperactive and conduct disordered behaviours (e.g., Taylor & Rogers, 2005). Furthermore, whilst we were careful to include only children functioning in the normal range of intelligence, two excluded children had a family history of learning disability, and a few excluded children had a family history of criminality. Moreover, neurobiological factors, such as executive and emotional functioning, are thought to play an important role in the aetiology of both severe conduct problems and ASD. Moffitt et al. (2001) consider the possibility of a shared neurodevelopmental basis for autism and early-onset persistent antisocial behaviour. With regard to the current study, more excluded than comparison children showed symptoms of hyperactivity, impulsivity, and inattention; however there were no between-group

differences for Hyperkinetic Disorder. The design of this study, however, does not allow for any causal inferences to be made as to influence of neurobiological factors in the development of either CD or ASD.

4.2. Environmental Factors

Environmental influences on child development can also be significant. Child protection concerns and social service involvement were common in the excluded group. Indeed, familial instability and poor parenting have been associated with behavioural problems (e.g., London School of Economics, 1999). With its roots in social learning theory, maladaptive hostile social information processing provides an explanation for aggressive and antisocial behaviour (Crick & Dodge, 1996). Hostile processing may, however, represent a genuine survival strategy in response to a deprived and violent environment, rather than a processing deficit. Overgeneralised hostile processing may be a reflection of the social climate, or an interaction between social conditions and individual processing styles (Hudley & Graham, 1993).

In summary, conduct problems reported in this study were, in all likelihood, multi-determined as in any study, with significant interactions between biological and environmental factors. Excluded and at-risk-of-exclusion children form an extremely heterogeneous group, highlighting the methodological importance of comparison groups. Whilst the excluded and comparison groups in the current study were well balanced on many variables, they could have been better balanced with regard to parental education and PIQ (of the child) given a longer recruitment period.

4.3. *PDDs*

The current study has identified children who have a less prototypic form of ASD, evident in that more than three quarters of the PDD diagnoses assigned were either Atypical Autism or PDD unspecified. PDD-Not Otherwise Specified (DSM-IV: APA, 1994) or PDD unspecified (International Classification of Disorders [ICD-10]: World Health Organisation [WHO], 1993) are categorisations that describe children who have general difficulties pertaining to the autistic triad of impairment (concerning reciprocal social interaction skills, communication skills, and the display of stereotyped behaviour or restricted interests), but who fail to meet diagnostic criteria for a specific PDD.

PDD-NOS is at least twice as prevalent as autism (Chakrabarti & Fombonne, 2001). Furthermore, fewer stereotyped and repetitive behaviours are reported in children with PDD-NOS compared to those with autism or Asperger's syndrome (Allen et al., 2001; Walker et al., 2004). Results from the current study suggest social communication deficits in the absence of stereotypy and repetitive behaviours may be a hallmark of a small proportion of excluded children. This may be compatible with the proposed continuous distribution of social reciprocity and communication skills in the general population (Charman, 2002; Towbin et al., 2005). Unfortunately, present classification systems may be inadequate for the diagnosis of these less prototypic forms of autism (Tanguay, Robertson & Derrick, 1998). Additionally, further research is needed to characterise PDD-NOS, so that children with different subtypes may be better understood and provided for in terms of services (Walker et al., 2004). Detection of these children is particularly challenging as many: function in the normal range of

intelligence; present with less prototypic autistic features; and have significant comorbidity, e.g., with CD.

4.4. Empathic Dysfunction

The two psychiatric disorders most commonly associated with empathic dysfunction are autism and psychopathy (Blair, 2005). Psychopathy is a personality disorder characterised by interpersonal or affective disturbance and social deviance. Psychopathic traits include: deceitfulness; manipulation; a lack of remorse or responsibility for actions; poor empathy; impulsivity; and sensation seeking (Cooke & Michie, 2001).

CD in childhood is linked to Antisocial Personality Disorder in adulthood (e.g., Dolan, 2004). Similarly, early-onset CD is associated with “life course persistent antisocial behaviour” (Moffitt et al., 2001). Moreover, Antisocial Personality Disorder is reported in psychopathy (e.g., Soderstrom, Nilsson, Sjodin, Carlstedt & Forsman, 2005) as measured by the Psychopathy Checklist (Hare, 1991). Whilst Forth and Burke (1998) report an association between psychopathy and severe conduct disordered behaviour in adolescents, studies of comorbidity of disruptive behaviour disorders with psychopathic traits are lacking for younger children (Dolan, 2004).

Psychopathy is not included in the present psychiatric diagnostic systems for adults. Moreover, there is a lively debate in the literature as to the existence of psychopathy in childhood. Fundamental concerns relate to: the validity of assessment tools; the

developmental appropriateness of assessment; the agreement with the construct of psychopathy in adulthood; and the stigmatising effect of labelling children in this way (Dolan, 2004). Conversely, it is argued that early detection of psychopathic traits in high-risk groups may be of value with regard to intervention (Frick, 2002). Whilst the prevalence of psychopathy in childhood and adolescence is not known, research suggests higher rates for incarcerated youths than for adult samples (Forth & Burke, 1998). Adult prevalence for psychopathy is approximately 1% (Hare, 1993, p. 74). Any prevalence estimates for children and adolescents must be interpreted with caution as false positives are likely due to increased impulsivity and irresponsibility in adolescence (Dolan, 2004), also reflected in the use of the term *adolescent-limited CD*.

Callous-unemotional traits associated with psychopathy may also feature in ASDs. Research on comorbidity is however lacking, despite reported ASD in forensic samples (Soderstrom, Sjodin, Carlstedt & Forsman, 2004). Attempts have been made to dissociate different forms of empathy in individuals with psychopathy and autism drawing on neuropsychological and neuroimaging data (Blair, 2005). Blair (2005) refers to three different types of empathy. Cognitive empathy describes theory of mind or mentalising skills (the ability to represent behaviour in terms of mental state). Motor empathy refers to the ability to imitate facial expressions, vocalisations and postures of another person. Finally, emotional empathy describes the ability to process facial expressions. Whilst impaired cognitive and motor empathy are reported for individuals with autism, these impairments are not reported for individuals with psychopathic traits (Blair, 2005). Two out of three studies on theory of mind and individuals with

psychopathy show no global theory of mind impairment (Richell et al., 2006). Theory of mind deficits may therefore be a distinguishing neurocognitive marker for ASD (Ritchell et al., 2003). Furthermore, whilst there is evidence of emotional empathy impairment in individuals with autism, it appears less selective than that observed in psychopathy. Impaired processing of sad and fearful facial expressions in particular is reported for individuals with psychopathic traits (Blair, 2005).

Data from the same sample as reported for the current study, show poorer mentalising abilities for excluded than comparison children (Parker, 2006). Furthermore, these data show no statistically significant group differences in fear recognition (Parker, 2006) supporting the validity of the identified social communication deficits. However, the standard deviations for emotional recognition in typically developing children in this age range are large, making it difficult to see significant differences in small samples (Lawrence et al., 2006). Furthermore, to my knowledge there is no research to suggest an association between pragmatic language deficits, characteristic of ASD, and psychopathic traits. With regard to the current study, this further supports the validity of the autistic nature of the social communication deficits identified.

Nonetheless, the current study did not measure psychopathic traits which may confound the identified PDDs. Controversy regarding the construct validity of psychopathy is particularly relevant for younger children, i.e., for the age range in the current study. Furthermore, non-linear development of social cognition in typically developing children where improved ability is followed by a plateau, or even worsening of ability in

early adolescence has implications for reliably assessing psychopathy in childhood (Lawrence et al., 2006). Most measures for psychopathy are devised for use with children in late childhood and adolescence. The Psychopathy Screening Device (Frick, 1998) is an exception, intended for use with children ranging from 6 to 12 years of age, which would have been more appropriate for the age range studied.

In sum, overlap in terms of empathic functioning in individuals with ASD and those with psychopathy is possible. However, the significantly lower prevalence of psychopathy relative to ASD is noted (Constantino & Todd, 2003; Hare, 1993, p. 74) along with the methodological and developmental challenges to assessing psychopathy in childhood. Longitudinal studies will therefore be essential in establishing the stability of psychopathic traits across the lifespan, as well as illuminating aetiology with regard to disentangling psychopathy from ASDs (Dolan, 2004).

4.5. Wider Implications

The dimensional nature of developmental disorders makes distinguishing the edges of a diagnosis and normality more difficult (Farmer & Oliver, 2002). However dimensional conceptualisation of childhood disorders is arguably more ecologically valid. Additionally, the distinction between PDDs and specific developmental disorders is less clear-cut than previously thought (e.g., Towbin et al., 2005). Comprehensive clinical assessment should therefore include detailed information on development (e.g., 3di: Skuse et al., 2004), as well as mental health. Unfortunately, services are organised

separately as is the literature, which may contribute to mislabelling and under-detection of ASD.

Whilst it is clearly beyond the scope of this study to infer causality with regard to primary social communication deficits and secondary conduct disordered behaviours, this study adds to the existing data (Gilmour et al., 2004; Gilchrist et al., 2001) reporting comorbidity between ASD and CD. Theoretical debate aside, this study provides evidence of previously undetected ASD that needs to be addressed in terms of appropriate intervention. Whilst exclusion from school is unlikely to benefit any child, exclusion for children with ASD is particularly inappropriate and unlikely to be beneficial, with regard to learning from mistakes, as the core social communication deficit is not addressed (National Foundation for Educational Research, 2003).

5.0. Personal Reflections

5.1. General Considerations in Carrying out the Research

Several general themes emerge as important in the overall process of carrying out this piece of research. These include: presenting the research to different groups of people; managing time; documenting appropriately; and the value of joint working.

5.1.1. Introducing the research and inviting participation

We had to take an assertive approach, balancing impinging on the good will of families and teachers with the short-time frame for completing the research. Varying the way in which we presented our research was important, in terms of the language used and also with regard to highlighting the potential benefits and limitations of our involvement according to the context (schools, excluded and comparison children). Providing schools and families with advice and information sheets for behaviour problems helped with engagement and recruitment to the study.

5.1.2. Organisation

Good organisation and time planning proved essential in terms of: sharing resources between other researchers; liaising with schools; responding to families; organising appointments; and sending out paperwork. We learnt to use time effectively and flexibly when unexpected events occurred, such as technical difficulties with the laptops or non-

attendance to an appointment. Managing time and pacing during assessments was important, as well as working around parents' other commitments.

Furthermore, comprehensive documentation and good record keeping was essential during the recruitment and assessment period. Getting written consent from the legal guardian before meeting with the family was necessary where there were informal care arrangements. We were also careful to obtain written consent to pass assessment information on to local child and family services where this was requested.

Breaking the work down into attainable goals and prioritising was another valuable skill developed during this time. This was a challenge to my personal working style of setting too much work and not noticing my achievements. Furthermore, co-ordinating working antisocial hours to carry out assessments, in addition to balancing the demands of clinical placements and academic deadlines was challenging.

5.1.3. Joint working

This project was particularly suited to joint working. Working together enabled us to be more efficient in terms of recruiting a larger number of schools. Joint working also proved important in terms of emotional support, reflexivity and personal safety during home visits. The opportunity to debrief each other and use this exchange to notice what had gone well helped keep the momentum going over the one year recruitment period.

5.2. Experience of Assessments with Excluded Children

The experience of carrying out the assessments with the excluded families was eye-opening both with regard to the physical and emotional environments. This experience afforded me the opportunity to meet with people who I might otherwise not have had any contact with either clinically or personally.

5.2.1. Engagement issues

Re-iterating the aims of the project and what involvement entailed was essential, as well as not presuming participation was still desired upon meeting with families. Other engagement issues for excluded children and their families included: assessment fatigue; feeling criticised by services; and perceiving services as unhelpful. Considering families' relationship to (professional) help can be important in this regard (Reder & Fredman, 1996).

It was, on occasion, difficult to hear parental criticism of the child and difficult to manage parental hostility. The assessment experience highlighted the importance of taking a non-judgemental perspective on parenting, being careful to not impose personal values whilst still being mindful of potential risk to the child. In adopting a neutral stance, our intention was to give permission to talk about experiences. During the assessment period I also noticed that I developed a certain habituation to hearing about violence and criminality.

5.2.2. Physical and emotional environment

The environments I experienced as the most difficult were those that felt emotionally uncontained. Several homes were in a poor state of repair and cleanliness. We tried to make a positive comment about some aspect of the environment in an attempt to communicate our gratitude at being invited into their homes. The experience of the home visits confronted me with a level of poverty of which I was not fully aware, despite having previously worked in a local child and family service in the same area. This experience stimulated many reflections about my own level of privilege and opportunity. For a few families external factors felt overwhelming, making it difficult to feel hopeful about the future.

5.2.3. Strengths and resources in families

Whilst assessments with excluded families were particularly challenging, we were struck by a number of strengths and resources. We were aware of the generosity of families inviting us into their homes and welcoming us. There were a number of inspiring stories, such as surviving domestic violence or serious drug use. The positive attitude displayed by several families towards their children, despite the difficulties in terms of their behaviour, was particularly inspiring. We also saw examples of listening to the child's perspective, despite the child having been labelled as deliberately naughty. Grandparents were the main carers for several children. For these families, there was a sense of the importance of the child remaining within the wider family. We reflected on the impact of reaching retirement and then bringing up a young child with behavioural problems. Furthermore, I had previously come in contact with a family that participated

in the research through a clinical placement. It was extremely encouraging to see progress as a result of hard work and commitment by both the parent and health and educational services. Overall, we were particularly struck by families' resilience and parents' willingness to draw on their experiences in an attempt to help others and improve themselves.

5.3. Experience of Assessments with Comparison Children

Despite similar levels of socio-economic deprivation, the experience of assessing comparison children was markedly different to that of assessing excluded children. Our impression was that there was less familial disturbance for the comparison children, which is reflected in the absence of child protection concerns and minimal social services involvement. This raises the issue of risk and resilience factors, specifically how adverse life events and environments are risk factors to mental health problems but not causal factors in themselves (Carr, 1999). In terms of our experience as researchers, this was important in resisting an unhelpful attitude of hopelessness. Finally, these assessments were considerably quicker to carry out. This was probably due to the absence of difficulties experienced by the comparison children and their parents.

5.4. Use and Development of Clinical Skills

I found that I was able to both draw on, and further develop my clinical skills through carrying out this piece of research. As researchers, we used our clinical skills in our contact with schools and families. Furthermore, this research experience prompted me to reflect on the scientist-practitioner split.

5.4.1. Clinical skills and participating families

Problem free talk (Selekman, 2002) was useful in engaging both parents and children. This helped us find common ground with families. At times our difference became explicit, for example people commenting on how we talked differently to them. We tried to acknowledge difference, whilst attempting to join with the language of the family. Furthermore, we also took a solution focused approach (Selekman, 2002) to conversations and noticed strengths, which were able to feedback during the assessments, and also in the assessment reports.

A few excluded children failed to respond positively to praise or one to one attention during assessment. These children may have had countless experiences of failure and of being reprimanded. We thought it was, nonetheless, important to communicate strengths that we had noticed, and to show our appreciation for their participation through giving certificates to the child and sending assessment summaries to the families.

5.4.2. Clinical skills and schools

In the interests of encouraging participation in the study, it was important to place minimal demands on the schools, and to be sensitive with regard to the timing of our requests in the school year. Having a liaison person, usually the special educational needs coordinator proved essential in maintaining regular contact.

Solution focused ideas and noticing strengths and resources were similarly useful when talking with overburdened teachers (Selekman, 2002). Regular contact and thank you cards were also helpful in keeping lines of communication open and expressing gratitude. Finding creative solutions was important, as well as being flexible and showing perseverance. This was particularly relevant for obtaining teacher questionnaires, which in some cases required up to eight reminders. For one excluded child we had to get another non-educational professional to complete the questionnaire, as the child was out of education for the entire duration of the recruitment period. Difficulty obtaining these data was further complicated by staff sickness and turnover. Additionally, two of our participating schools were on the government Fresh Start Program where they were closed, all posts re-advertised and then re-opened under a new name (DfSE, n.d.).

5.4.3. Working with the scientist-practitioner split

It was important to be clear about, and remind ourselves of, our objectives and our limitations in terms of what we were able to offer individual families and schools. For excluded families in particular, it was necessary to hear about and acknowledge other concerns not directly related to our study. We learnt how to limit these conversations, focusing on where other needs might be met. Furthermore, we had to be very careful about our position, as we were not seeing the families in a clinical capacity. We were conscious of past or present involvement with other agencies who may hold different perspectives. On one occasion our assessment was incongruent with a previous assessment carried out by a local child and family service. Careful wording was also essential in the assessment reports highlighting the research context. We favoured general comments above quoting specific ranges or figures. Our intention was to maintain a neutral position, enabling the family to take forward ideas, rather than directing what should be done.

We felt able to give the families something back in terms of recognising their strengths and reinforcing attempts to understand, rather than label, their child's behaviour. Most families gave a copy of the assessment report to the school. Aware of the impact of teachers' expectations on children's behaviour and attainment, we hoped that drawing attention to strengths in 'problem families' had the effect of telling a more positive story about the family in line with narrative ideas (e.g., Freeman, Epston, & Lobovits, 1997).

This research has shown me the value, but also the difficulties involved in recruiting a hard to reach population. This experience has not only developed my research skills, it has also provided me with an opportunity to hone my clinical skills. Typically, during clinical placements lower turnover is favoured in the interests of more detailed work with clients. In contrast, this experience, has exposed me to a large number, and wide range of different families.

6.0. Overall Summary and Final Conclusions

This thesis considers the under-detection of social communication deficits of an autistic nature in a small proportion of children with conduct problems. This argument was advanced in Part I through: critical examination of the diagnostic classification systems; reinterpretation of the behavioural markers associated with CD; and examination of sample definition in research.

Undetected social communication problems of an autistic type were hypothesised for excluded and at-risk-of-exclusion primary school children in the empirical paper reported in Part II, in line with pragmatic deficits identified in this population (Gilmour et al., 2004). The hypotheses were supported with significantly more excluded than comparison children scoring in the clinical range on the CCC (Bishop, 1998) and on the 3di (Skuse et al., 2004). A third of the excluded children met criteria for a PDD and a CD (ICD-10; WHO, 1993). None of the comparison children met criteria for either of these diagnoses. These findings therefore support the assertion that social communication deficits are undetected in a proportion of children with conduct problems. Under-detection of social communication deficits needs to be addressed in both educational and clinical settings. To this end screening may be useful for children with exclusion histories and those considered at-risk-of-exclusion. Furthermore, this overlap of social communication deficits of the autistic type with conduct problems suggests routine screening for research, so that children with these difficulties are not inadvertently included in conduct disordered samples.

The critical appraisal Part III provided an opportunity for further discussion of: methodological issues; the influence of culture; and multiple influences on child development. Furthermore, this section includes a personal reflection on the research process, and consideration for working with the scientist-practitioner split.

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Appendix A: Letter of Ethical Approval

Institute of Child Health
 and Great Ormond Street Hospital for Children NHS Trust
 UNIVERSITY COLLEGE LONDON

6 Cavendish Street, London, WC1N 1EH. Telephone: (020) 7712 4789 Fax: (020) 7905 2200

3rd September 2003

Dr J Gilmour
 Behavioural and Brain Sciences Unit
 ICH

The
 child
 first
 and
 always

Dear Dr Gilmour,

Title: **The detection, measurement and treatment of social communication disorders among children excluded from school**

Protocol number/version: N/A

Notification of ethical approval

The above research has been given ethical approval after review by the Great Ormond Street Hospital for Children NHS Trust / Institute of Child Health Research Ethics Committee subject to the following conditions.

1. Your research must commence within twelve months of the date of this letter and ethical approval is given for a period of thirty-six months from the commencement of the project. If you wish to start the research more than twelve months from the date of this letter or extend the duration of your approval you should seek Chairman's approval.
2. You must seek Chairman's approval for proposed amendments to the research for which this approval has been given. Ethical approval is specific to this project and must not be treated as applicable to research of a similar nature, eg. using the same procedure(s) or medicinal product(s). Each research project is reviewed separately and if there are significant changes to the research protocol, for example in response to a grant giving body's requirements you should seek confirmation of continued ethical approval.
3. Researchers are reminded that REC approval does not imply approval by the GOS Trust. Researchers should confirm with the R&D office that all necessary permissions have been obtained before proceeding.



4. It is your responsibility to notify the Committee immediately of any information which would raise questions about the safety and continued conduct of the research.
5. On completion of the research, you must submit a report of your findings to the Research Ethics Committee. You may also be required to submit annual reports.
6. Specific conditions pertaining to the approval of this project are:
 - The use of the enclosed standard consent forms for the research. A copy of the signed consent form must be placed in the patient's clinical records and a copy must be kept by you with the research records

Yours sincerely

Laura Howe
Research Ethics Coordinator
l.howe@ich.ucl.ac.uk

*Appendix B: Parent Information***Parent Information Sheet****The detection, measurement and treatment of social communication disorders among children excluded from school.****Aim.**

We think that some children who get into trouble at school may have a previously unidentified social communication disorder. The disorder means they have difficulty using and understanding language and getting along with people. Some of these children may have been excluded or are at-risk-of-exclusion from school.

Why is the study being done?

We want to screen children who are at-risk-of-exclusion or have been excluded from school. We think some of these children may have features of the disorder we are investigating. We will offer children and their families who we identify as being affected in the course of this study, specialised support and treatment. We will also help teachers in school understand the sort of problems that these children have. The support and treatment we have in mind is specialised. The treatment for children with *general* behavioural difficulties is unlikely to be as helpful to the particular children we identify.

How is the study to be done?

Two research workers will visit you at home. If you prefer we can arrange to see you and your child at your child's school. We will set up the appointment at a time that suits you. It will last a few hours and usually only one appointment will be necessary.

During the appointment one research worker will talk to you about how your child is getting along. In particular we will want to discuss language and social relationships. At the same time, the other research worker will do a number of different games and puzzles with your child.

We will also ask your permission to contact your child's school (even if your child has been permanently excluded from school). We will ask school teachers to complete questionnaire about similar topics to the ones you discussed with the research worker during your appointment.

What are the risks and discomforts?

There are no discomforts associated with the assessments we are doing. Children usually enjoy doing the games and puzzles.

There is a chance that in the course of the assessment, we will find that your child has a previously unidentified disorder. If we think your child is affected, we will offer specialised treatment and support.

Who will have access to the case/research records?

Only the researchers and a representative of the Research Ethics Committee will have access to the data collected during this study.

The use of some types of personal information is safeguarded by the Data Protection Act 1998 (DPA). The DPA places an obligation on those who record or use personal information, but also gives rights to people about whom information is held. If you have any questions about data protection, contact the Data Protection officer via the switchboard on 020 7405 9200 extension 5217.

What are the arrangements for compensation?

This research has been approved by an independent Research Ethics Committee who believe that it is of minimal risk to your child. However, research can carry unforeseen risks and we want you to be informed of your rights in the unlikely event that any harm should occur as a result of taking part in this study.

No special compensation arrangements have been made for this project but you have the right to claim damages in a court of law. This will require you to prove a fault on the part of the Hospital and/or any manufacturer involved.

What are the potential benefits?

In time, more excluded children may be screened as a matter of course, to assess for the disorders we are investigating. Specialised treatment and support is available in the NHS, if a child is properly identified as having the disorder in the first place. Ultimately some of these children may be able to stay in mainstream school, rather than attend schools for children with special educational needs which are more expensive to run.

Do I have to take part in this study?

If you decide, now or at a later stage, that you do not wish to participate in this research project, that is entirely your right and will not in any way prejudice any present or future treatment.

Who do I speak to if problems arise?

If you have any complaints about the way in which this research project has been, or is being conducted, please, in the first instance, discuss them with the researchers (either Rose Donno or Gaby Parker). If the problems are not resolved, or you wish to comment in any other way, please contact the Chairman of the Research Ethics Committee, by post via the Research and Development Office, Institute of Child Health, 30 Guilford Street, London WC1N 1EH, or if urgent, by telephone on 020 7905 2620 and the Committee administration will put you in contact with him.

Details of how to contact the Researchers.

If you have any queries please contact either Rose Donno on [redacted] or Gaby Parker on [redacted] in the first instance. Dr Jane Gilmour can be contacted C/o The Sub-Dept. of Clinical Health Psychology, University College London, Gower Street, WC1 6BT.

Letter inviting participation for excluded children

Dear.....

Re: The detection, measurement and treatment of social communication disorders among children excluded from school.

I am writing to invite you to take part in a research project. I have enclosed an information sheet that explains the study. We think that some children who get into trouble at school have a previously unidentified disorder which means that they have difficulties using and understanding language and getting along with people.

We want to talk to families with children who are doing well at school to compare their social communication with that of children who are at-risk-of-exclusion.

If you would like to know more about the study, please complete the form below and return it in the pre-paid envelope. If you indicate an interest, you are not committed to take part. If you do decide to take part, you can withdraw at any time.

Yours sincerely

Dr Jane Gilmour
Lecturer in Clinical Psychology

✂-----

Research project at University College London

I am interested in finding out more about the project.

Returning the slip does not mean I am indicating I want to take part.

Your name.....

Your child's name.....

Your child's date of birth.....

Your address.....

.....

Your telephone number.....

Letter inviting participation for control children

Dear.....

Re: The detection, measurement and treatment of social communication disorders among children excluded from school.

I am writing to invite you to take part in a research project. I have enclosed an information sheet that explains the study. We think that some children who get into trouble at school have a previously unidentified disorder which means that they have difficulties using and understanding language and getting along with people.

We want to talk to families with children who are doing well at school to compare their social communication with that of children who are at-risk-of-exclusion.

If you would like to know more about the study, please complete the form below and return it in the pre-paid envelope. If you indicate an interest, you are not committed to take part. If you do decide to take part, you can withdraw at any time.

If you would like to discuss the project, you can telephone either Rose Donno on or Gaby Parker on

Yours sincerely

Dr Jane Gilmour
Lecturer in Clinical Psychology

✂-----

Research project at University College London

I am interested in finding out more about the project.

Returning the slip does not mean I am indicating I want to take part.

Your name.....

Your child's name.....

Your child's date of birth.....

Your address.....

.....

Your telephone number.....

*Appendix C: Child Information****Child Information Sheet (excluded children)*****The detection, measurement and treatment of social communication disorders among children excluded from school.****Aim.**

We think that some children who are getting into trouble with their teacher and classmates at school might have a special type of problem. The problem means that they might find it difficult to talk to other children or understand what they are saying. They may also have problems getting along with other people. Children with this type of problem can't help it, but nobody may know yet that they have these difficulties.

Why is the study being done?

There are special ways to help children with these types of difficulties. If we can find out which children have the problems in the first place, we may be able to help them keep out of trouble.

What will happen?

If you take part, we will come and see you at home or at school for a couple of hours. You will be asked to do lots of different games and puzzles. Children usually enjoy doing them.

*Child Information Sheet (comparison children)***The detection, measurement and treatment of social communication disorders among children excluded from school.****Aim.**

We want to talk to children, like you, who are getting along well in school. We know that you are not getting into trouble at school but we think that some children who *are* getting into trouble might have a special type of problem. The problem means that they might find it difficult to talk to other children or understand what they are saying. They may also have problems getting along with other people. Children with this type of problem can't help it, but nobody may know yet that they have these difficulties.

Why is the study being done?

There are special ways to help children with these types of difficulties. If we can find out which children have the problems in the first place, we may be able to help them keep out of trouble.

What will happen?

If you take part, we will come and see you at home or at school for a couple of hours. You will be asked to do lots of different games and puzzles. Children usually enjoy doing them. We need to know how children who are getting along well at school, do in these games and puzzles. That is why we have asked you to take part.

Appendix D: Consent and Assent Forms

REC No. 01BS09

Version 1, dated 3-Sep-03

Great Ormond Street Hospital for Children NHS Trust and Institute of
Child Health Research Ethics Committee

**Consent Form for PARENTS OR GUARDIANS
of Children Participating in Research Studies**

Title: The detection, measurement and treatment of social communication disorders among children excluded from school

NOTES FOR PARENTS OR GUARDIANS

1. Your child has been asked to take part in a research study. The person organising that study is responsible for explaining the project to you before you give consent.
2. Please ask the researcher any questions you may have about this project, before you decide whether you wish to participate.
3. If you decide, now or at any other stage, that you do not wish your child to participate in the research project, that is entirely your right, and if your child is a patient it will not in any way prejudice any present or future treatment.
4. You will be given an information sheet which describes the research project. This information sheet is for you to keep and refer to. *Please read it carefully.*
5. If you have any complaints about the way in which this research project has been or is being conducted, please, in the first instance, discuss them with the researcher. If the problems are not resolved, or you wish to comment in any other way, please contact the Chairman of the Research Ethics Committee, by post via The Research and Development Office, Institute of Child Health, 30 Guilford Street, London WC1N 1EH or if urgent, by telephone on 020 7905 2620 and the committee administration will put you in contact with him.

CONSENT

I/We _____, being the parent(s)/guardian(s) of
_____ agree that the Research Project named above has been
explained to me to my/our satisfaction, and I/We give permission for our child to take part
in this study. I/We have read both the notes written above and the Information Sheet
provided, and understand what the research study involves.

SIGNED (Parent (s)/Guardian (s)) PRINTED DATE

SIGNED (Researcher) PRINTED DATE

REC No. 01BS09

Version 1, dated 3-Sep-03

REC No. 01BS09

Version 1, dated 3-Sep-03

Great Ormond Street Hospital for Children NHS Trust and Institute of
Child Health Research Ethics Committee

Assent Form for CHILDREN Participating in Research Studies

Title: The detection, measurement and treatment of social communication disorders among children excluded from school

NOTES FOR CHILDREN

1. You have been asked to take part in some research. The person organising that study must explain the project to you before you agree to take part.
2. Please ask the researcher any questions you like about this project, before you decide whether to join in.
3. If you decide, now or at any other time, that you do not wish to be involved in the research project, just tell us and we will stop the research. If you are a patient your treatment will carry on as it would normally.
4. You will be given an information sheet which describes the research. This information is for you to keep and refer to at any time. *Please read it carefully.*
5. If you have any complaints about the research project, discuss them with the researcher. If the problems are not resolved, or you wish to comment in any other way, please contact the Chairman of the Research Ethics Committee, by post via The Research and Development Office, Institute of Child Health, 30 Guilford Street, London WC1N 1EH or if urgent, by telephone on 020 7905 2620 and the committee administration will put you in contact with him.

ASSENT

I _____ agree that the Research Project named above has been explained to me to my satisfaction, and I agree to take part in this study.
I have read both the notes written above and the Information Sheet about the project, and understand what the research study involves.

SIGNED	PRINTED	DATE
_____	_____	_____
SIGNED (Researcher)	PRINTED	DATE
_____	_____	_____

REC No. 01BS09

Version 1, dated 3-Sep-03

*Appendix E: 3di Pre-entry Questionnaire***Your child's Developmental History**

Child Name.....Age.....D.O.B.....

Thank you for filling in the information below, we use the replies to these questions as a guide to talk about some of the issues described. The information helps us to know what some of your concerns are and helps us keep the interview short especially for younger children who can get restless in the interview situation.

If there are any questions you do not know the answer to please leave them blank and we can talk about them further when we meet. Thank you very much for your help

(X.X.X = 3Di question number)

Background details of family members:

3.1.1 Mother's name.....Date of Birth.....

3Di School/academic/work:

3.4.1 Did you have any academic difficulties at school? Yes/No

3.4.2 Which subjects?

.....

3.4.3 Did you receive extra help? Yes/No

3.4.5 Did you have any friendship difficulties at school? Yes/No

3.4.7 Did you always attend mainstream school? Yes/No

3.4.9 What age did you leave school?Years.....Months

3.4.10 Did you go on to further education? Yes/No

3.4.11 What level? FE college/University/other

3.4.16 Have any other members of your family had difficulties at school?

Yes/No

If yes, give details below:

1.

2.

3.

3.3.1 What is your current occupation?.....

3.1.1 Father's Name.....Date of Birth.....

School/academic/work

3.4.19 Did you have any academic difficulties at school? Yes/No

3.4.20 Which subjects?

3.4.21 Did you receive extra help? Yes/No

3.4.23 Did you have any friendship difficulties at school? Yes/No

3.4.25 Did you always attend mainstream school? Yes/No

3.4.27 What age did you leave school?Years.....Months 3.4.28

Did you go on to further education? Yes/No

3.4.29 What level? FE college/University/other

3.4.30 Have any other members of your family had difficulties at school?

Yes/No

If yes, give details below:

1.

2.

3.

3.3.2 What is your current occupation?.....

If no contact with father, please give details of other Male carer:

3.1.1 Name.....Date of Birth.....

Other Children:

3.2.1 Please give details of all children who live, or have in the past lived with your child:

Surname	Forename	Gender	Date of Birth	Status (full / half / step sibling)
1.		M / F		
2.		M / F		
3.		M / F		
4.		M / F		

Please continue over the page if necessary

Education:

5.1.1 Please list below, in date order, playgroups/preschool/schools attended:

Name	Stage	Age Started	Age Left	Details of any Difficulties	Details of any Help Given
1.					
2.					
3.					

Please continue over the page if necessary

5.1.2 Current School Name and address:

5.1.3 Headteacher's name:.....

5.1.4 Does your child have special educational needs? Yes/No

5.1.5 Please give brief details of needs:

5.1.6 Does your child have any extra help at school? Yes/No

5.1.7 In which areas? (for example: reading, spelling, maths,
communication problems)

5.1.8 Is your child expected to do homework?

5.1.9 Does your child make careless mistakes when doing their
homework?

No / Possibly / Definitely (under 6 months) / Definitely (over 6 months)

5.1.10 Is your child much worse in making careless mistakes than other
children their age?

No / Possibly / Definitely (under 6 months) / Definitely (over 6 months)

5.1.11 Has your child been recommended for a statutory assessment?
Yes/No

5.1.12 What stage is the process at? (please circle one):

School Action / School Action Plus / Statement of Special Needs issued

5.3.9 Has your child ever belonged to any school clubs? Yes/No

5.3.10 Has your child ever belonged to any other clubs? Yes/No
(Cubs, sports Club, Youth Club etc)

5.3.11 Please give details:

1.....School/Other (delete as appropriate)

2.....School/Other (delete as appropriate)

3.....School/Other (delete as appropriate)

5.3.12 Has your child ever been asked to leave a club for any reason?
Yes/No

5.3.13 Please give details of why they were asked to leave:

Pregnancy

4.1.1 What was the length of the pregnancy (in weeks)?.....
Weeks

History of Development

4.1.2 Did you smoke at all during pregnancy? Yes/No

If yes, when during pregnancy? 0-3 months / 4-6months / 7-9 months

4.1.3 Did you drink alcohol at all during pregnancy? Yes/No

If yes, when during pregnancy? 0-3 months / 4-6months / 7-9 months

4.1.4 Did anything abnormal or worrying occur during the pregnancy?
Yes/No

4.1.5 What were the difficulties:

4.1.6 Was your child born in hospital? Yes/No

4.1.7 If not what were the birth arrangements:

4.1.8 Were there any difficulties during the birth? Yes/No

4.1.9 What were the difficulties:

4.1.10 What was your child's birth weight (in kg)Kg

4.1.11 For how many days after the birth were you in hospital?
.....days

4.1.12 For how many days was your baby in hospital after the birth?
.....days

4.1.13 Was your baby in a special care baby unit? Yes/No

Medical history

4.2.1 Has your child ever had a hospital outpatient appointment? Yes/No

4.2.4 Please give details below:

Hospital Name	Age	Reason for appointment	Treatment
1.			
2.			
3.			
4.			

4.2.2 Has your child ever been admitted to hospital? Yes/No

4.2.4 Please give details below:

Hospital Name	Age	Reason for appointment	Treatment
1.			
2.			
3.			
4.			

4.2.3 Has your child ever had to go to a casualty? Yes/No

4.2.4 Please give details below:

Hospital Name	Age	Reason for Visit	Treatment
1.			
2.			
3.			
4.			

Please continue over the page if necessary

Other medical history

4.2.5 Has your child ever had a fit or convulsion? Yes/No

4.2.6 Please give details

Hearing

6.4.1 Has your child ever had an ear infection? Yes/No

6.4.2 How old was he/she?

.....years.....months

What happened then:

6.4.3 Has your child ever suffered from glue ear? Yes/no

6.4.4 How old was he/she?

.....years.....months

What happened then:

6.4.5 Has your child ever had grommets put in? Yes/no

6.4.6 How old was he/she?

.....years.....months

What happened then:

6.4.7 Does your child need to have the TV turned up louder than usual?

Yes/No

6.4.8 Does your child struggle to hear in a one-to-one conversation?

Yes/No

6.4.9 Has your child ever suffered hearing loss in either or both ears?

Yes/No

6.4.10 Have you ever thought your child might be deaf? Yes/No

6.4.11 Has your child ever had a medical assessment (audiometry) for hearing problems? Yes/No

Sensitivity to sounds

Is your child sensitive NOW to every day noises such

as a crowded street or a vacuum cleaner? Yes/No

6.5.2 At what age did this begin?

.....years.....months

6.5.3 Was your child EVER sensitive to such every day noises? Yes/No

6.5.4 At what age did this begin?
.....years.....months

6.5.5 Does your child sometimes NOW put his/her hands over his/her ears in response to ordinary sounds? Yes/No

6.5.6 At what age did this begin?years.....months

6.5.7 Did your child EVER put his/her hands over his/her ears in response to ordinary sounds? Yes/No

6.5.8 At what age did that begin?
.....years.....months

6.5.9 Does your child sometimes complain NOW that music is too loud? Yes/No

6.5.10 At what age did this begin?
..... years.....months

6.5.11 Did your child EVER complain that music was too loud? Yes/No

6.5.12 At what age did that begin?
.....years.....months

6.5.13 Have you ever had to adjust what you do because he/she is upset by noises? Yes/No

Eating and drinking

6.1.1 How was your child fed at the very beginning? Breast/Bottle

6.1.2 While still on fluids (bottle or breast), were there any difficulties Yes/No

If yes, please give details:

6.1.3 At what age was your child introduced to solids?
.....years.....months

6.1.4 What solids was your child started on:

6.1.5 Did he/she have any of these difficulties when starting with solids?

Yes/No

If yes, please give details (e.g. difficulties with chewing, gagging, persistent dribbling, problems with mixed textures e.g. fruit yogurt):

Current eating difficulties

6.2.1 Does your child have problems with food that needs chewing
(such as meat)? Yes/No

6.2.2 If yes, please give details
(e.g. food has to be cut up, eats without chewing etc):

6.2.3 Does your child have problems with food that contains a mixture
of textures (such as fruit yogurt)? Yes/No

6.2.4 If yes, please give details (e.g. avoids such foods, avoids orange
juice with bits in etc):

6.2.5 Does your child eat very quickly? Yes/No

6.2.6 Does your child eat very quickly? Yes/No

6.2.7 If yes to either, please give details (e.g. fills mouth completely
before swallowing, last to finish etc):

6.2.9 Does your child's appetite vary considerably from day to day?
Yes/No

6.2.10 If yes, please give details:

6.2.11 Does your child drink a lot, more than children of his/her age?
Yes/No

6.2.12 If yes, please give details (e.g. gets up in night to get a drink):

6.2.13 Does your child sweat a lot at night? Yes/Sometimes/No

If yes, please give details of sweating and whether anyone in
family sweats similarly:

Sleep

6.3.1 Did your child ever have problems sleeping as a baby? Yes/No

6.3.2 If yes, please give details:

6.3.3 At what time is your child asked to go to
bed?.....pm

6.3.4 At what time will your child actually go to
bed?.....pm

6.3.5 At what time will your child actually go to
sleep?.....pm

6.3.6 Does your child complain of waking up and not being
able to get back to sleep? Never/Sometimes/Often

6.3.7 Does your child wake up at night (not sleepwalking)
and wander round the house? Never/Sometimes/Often

Where does your child usually sleep at night?

Please circle one of the following:

Own bed (own room)

Own bed (parents' room)

Own bed (Siblings or others room)

In parents' bed

In bed with others

6.3.9 Does your child ever refuse to go to sleep without someone staying near
by? Yes/Possibly/No

6.3.10 Does your child ever come into your room in the middle of the night?
Often/Rarely /Never

6.3.11 Has your child ever refused to spend a night away from you? Yes/No

6.3.12 At what time does your child usually wake up in the mornings?.....am

6.3.13 Does your child have nightmares? Often/Sometimes/Never

6.3.14 Are these nightmares ever about being taken away from you or your leaving? Yes/Possibly/No

6.3.16 Does your child have night terrors (waking screaming/frightened, no recollection in the morning)?

Often/Sometimes/Never

6.3.17 Does your child sleepwalk?

Often/Sometimes/Never

6.3.18 Have you ever approached your GP, health visitor or someone else for help with a sleeping problem your child has had? Yes/No

Bladder and bowel

6.6.1 Does your child have diarrhoea? Often/Sometimes/Never

6.6.3 Does your child have constipation? Often/Sometimes/Never

6.6.5 Does your child wet the bed nowadays? Often/Sometimes/Never

6.6.7 Does your child ever soil his/her pants nowadays? Often/Sometimes/Never

Motor Development

7.1.1 How old was your child when he/she first sat without support on a firm surface?years.....months

7.1.2 How did your child begin to move around?

Don't know / crawling on hands and knees/ crawling flat (commando style) / shuffling on bottom / rolling:

7.1.3 At what age did your child start moving around on his/her own?.....years.....months

7.1.4 At what age did your child walk without holding on?
.....years.....months

Gait

7.2.1 Is there anything unusual about the way your child walks NOW?

(e.g. bouncing, exaggeration of toe-heel, up on toes) Yes/No

7.2.2 If yes, please give details:

Gross motor skills

7.3.1 Can your child ride a bicycle?

Has no problem/Adequately/With Difficulty/No

7.3.2. Can your child kick a ball that isn't moving?

Has no problem/Adequately/With difficulty/No

7.3.3 Can your child kick a ball while moving themselves?

Has no problem/Adequately/With difficulty/No

7.3.4 Can your child negotiate an object which is in the way but below their line of vision such as a low table? (e.g. would he/she manage not to walk into it?)

Has no problem/Adequately/With difficulty/No

7.3.5 Can your child dance to music: how does that work out from the point of view of coordination and so on?

Has no problem/Adequately/With difficulty/No

Fine motor skills

7.4.1 Can your child use a pencil or pen to produce reasonably neat writing?

Has no problem/Adequately/With difficulty/No

7.4.2 Can your child use a crayon or pencil for drawing purposes?

Has no problem/Adequately/With difficulty/No

7.4.3 Can your child use a pair of scissors (without supervision)?

Has no problem/Adequately/With difficulty/No

7.5.1 Can your child use a knife and fork?

Has no problem/Adequately/With difficulty/No

7.5.2 Can your child hold a piece of meat with the fork and cut it with the knife?

Has no problem/Adequately/With difficulty/No

7.5.3 When was your child first able to do this?

years.....months

7.5.4 How do your child's knife and fork skills compare with those of siblings when they were his/her age?

Same/Better/Not as good/Comparison not appropriate

7.5.5 Can your child tie their shoelaces without help?

Has no problem/Adequately/With difficulty/No

7.5.6 Can your child use their hands to make things or fit things together such as Lego?

Has no problem/Adequately/With difficulty/No

7.5.7 Can your child turn a key the right way to get through a door?

Has no problem/Adequately/With difficulty/No

7.5.8 Can your child get dressed the right way (e.g. not putting things on the wrong way round or putting both legs in one trouser leg)?

Has no problem/Adequately/With difficulty/No

7.5.9 Can your child coordinate filling a glass from a jug?

Has no problem/Adequately/With difficulty/No

7.5.10 Can your child turn a doorknob the right way to get through a door?

Has no problem/Adequately/With difficulty/No

Hand preference

7.6.1 Which hand does your child prefer to use when completing tasks?

Left/Right/Mixed

7.6.3 Which is the dominant hand for father?

Left/Right/Mixed

7.6.4 Which is the dominant hand for mother?

Left/Right/Mixed

Thank you very much for your help.

*Appendix F: Hyperkinetic Behaviour Questionnaire***HYPERKINETIC BEHAVIOUR (for parents)**

If any of the behaviours described below are present, please rate them according to whether they have been present for at least 6 months or less than 6 months.

3Di Question #	Behaviour	Absent	Possibly/Mild	Present under 6 months	Present at least 6 months
16.2.2	Makes careless mistakes/pays no close attention to detail				
16.2.3	Difficulty sustaining attention on tasks or play activities				
16.2.4	Does not seem to listen to what is being said to him/her				
16.2.5	Fails to follow through instructions/finish schoolwork				
16.2.6	Difficulty organising time to accomplish tasks/activities				
16.2.7	Avoids/dislikes tasks requiring sustained mental effort				
16.2.8	Often loses things necessary for tasks/activities e.g. books, assignments				
16.2.9	Easily distracted by things/events around him/her				
16.2.10	Often forgetful in the course of daily activities				
16.2.11	Often fidgets with hands or feet or squirms on seat				

16.2.12	Leaves place when expected to remain seated				
16.2.13	Often runs/climbs when it is not socially acceptable				
16.2.14	Often too noisy when playing or relaxing by him/herself in what would ordinarily be a quiet activity				
16.2.16	Is physically overactive much of the time, and this is not easily controlled/modified by adults or the suitability of the situation				
16.2.16	Often blurts out answers before question is completed				
16.2.17	Fails to wait in line or await turns in games/group situations				
16.2.18	Often interrupts or intrudes on others				
16.2.19	Often talks too much despite the evident disapproval of adults				

HYPERKINETIC BEHAVIOUR (for teachers)**NAME OF CHILD:****TODAY'S DATE:****CHILD'S DATE OF BIRTH:**

Have you know child for at least 6 months?

Yes/No

If any of the behaviours described below are present, please rate them according to whether they have been present for at least 6 months or less than 6 months. If you have known the child for less than a period of 6 months, AND the behaviour described is present, please score as 'present over a period of less than 6 months'

3Di Question #	Behaviour	Absent	Possibly/Mild	Present under 6 months	Present at least 6 months
16.2.2	Makes careless mistakes/pays no close attention to detail				
16.2.3	Difficulty sustaining attention on tasks or play activities				
16.2.4	Does not seem to listen to what is being said to him/her				
16.2.5	Fails to follow through instructions/finish schoolwork				
16.2.6	Difficulty organising time to accomplish tasks/activities				
16.2.7	Avoids/dislikes tasks requiring sustained mental effort				
16.2.8	Often loses things necessary for tasks/activities e.g. books, assignments				
16.2.9	Concentration easily broken by things/events around him/her				
16.2.10	Often seems to be in a daydream				

16.2.11	Often fidgets with hands or feet or squirms on seat				
16.2.12	Leaves place when expected to remain seated				
16.2.13	Often runs/climbs when it is not socially acceptable				
16.2.14	Often too noisy when playing or relaxing by him/herself in what would ordinarily be a quiet activity				
16.2.16	Is physically overactive much of the time, and this is not easily controlled/modified by adults or the suitability of the situation				
16.2.16	Often blurts out answers before question is completed				
16.2.17	Fails to wait in line or await turns in games/group situations				
16.2.18	Often interrupts or intrudes on others				
16.2.19	Often talks too much despite the evident disapproval of adults				

*Appendix G: Conduct Behaviour Questionnaire***Conduct problems (for parents)**

If any of the behaviours described below are present, please rate them according to whether they have been present for at least 6 months or less than 6 months.

3Di Question #	Compared to other children the same age, your child...	Absent	Possibly/Mild	Present under 6 months	Present at least 6 months
15.2.2	Loses their temper more regularly?				
15.2.3	More often gets into arguments with adults, including members of the family?				
15.2.4	More often deliberately defies you or other adults?				
15.2.5	More often blames others for things that they have done wrong?				
15.2.6	Is more easily annoyed by other people or more easily takes offence when none is intended?				
15.2.7	Is more inclined to complain unjustifiably about not being treated fairly?				
15.2.8	Is more destructive towards their own belongings or property?				
15.2.9	Is more inclined to be spiteful or vindictive?				
15.2.10	Is more likely not to keep a promise				
15.2.11	More often tells lies?				
15.2.12	More often gets into fights?				

	Have they ever...				
15.2.13	Used a deadly weapon on another person?				
15.2.13	Been physically (sadistically) cruel to another person?				
15.2.13	Mugged or purse snatched from another person?				
15.2.13	Forced someone into sexual activity?				
15.2.17	Been cruel to an animal, deliberately				
15.2.15	Destroyed the property of others				
15.2.15	Deliberately set fires				
15.2.15	Persistent stealing/broken in?				
15.2.20	Bullied other children?				
15.2.19	Been the victim of bullying				
15.2.21	Stayed out very late without parental permission?				
15.2.21	Run away from home on more than one occasion or stayed out overnight after running away?				
15.2.21	Frequent truancy from school, beginning at under 13 years of age				
15.2.23	When did these problems first start				
15.2.24	How often do they occur outside home/family?				

Teacher Conduct Disorder Questionnaire

Child's Name: Date of Birth: _____
 Today's date: Person completing: _____

(Please tick only one column but add any comments you feel may be appropriate)

3Di Question #	Please indicate whether your pupil shows any of the following :	Definitely not	Possibly true /uncertain	Definitely, but only within the past 6 months	Definitely. Has been going on for more than 6 months	Comments
15.1.2	Temper tantrums?					
15.1.3	Arguing with adults?					
15.1.4	Defiant or oppositional behaviour?					
15.1.5	Deliberate attempts to annoy?					
15.1.6	Blaming others?					
15.1.7	Spitefulness or vindictiveness?					
15.1.8	Anger or resentment?					
15.1.9	Frequent lying?					
15.1.10	Frequent starting of fights?					
15.1.11	Use of a weapon that can cause serious harm?					
15.1.12	Physical cruelty to people?					

15.1.13	Physical cruelty to animals?					
15.1.14	Deliberate destruction of property (other than by fire)?					
15.1.16	Setting fire with risk or intention of causing serious damage?					
15.1.16	Stealing?					
15.1.17	Committing crime involving confrontation with victim?					
15.1.18	Forcing another person into sexual activity?					
15.1.19	Frequent bullying of others?					
15.1.20	Frequent truanting from school, beginning at under 13 years of age?					

*Appendix H: Teacher CCC data**Table 10: Teacher CCC Data for Excluded and Comparison Children*

Scale	Group	
	Excluded (N = 25)	Comparison (N = 21)
Intelligibility / fluency <i>M (SD)</i>	33.32 (4.39)	34.24 (1.87)
% in clinical range (n)	16(4)	5(1)
Syntax <i>M (SD)</i>	30.76 (1.62)	31.67 (0.66)
% in clinical range (n)	16(4)	0(0)
Inappropriate initiation <i>M (SD)*</i>	25.32 (2.69)	28.24 (1.09)
% in clinical range (n)	8(2)	0(0)
Coherence <i>M (SD)*</i>	33.32 (3.33)	34.38 (2.25)
% in clinical range (n) *	24(6)	19(4)
Stereotyped Language <i>M (SD)</i>	26.04 (3.45)	28.62 (1.86)
% in clinical range (n)	16(4)	0(0)
Use of Context <i>M (SD)*</i>	27.24 (2.74)	30.19 (2.34)
% in clinical range (n)*	20(5)	5(1)
Rapport <i>M (SD)*</i>	30.28 (2.99)	31.52 (2.40)
% in clinical range (n)	20(5)	19(4)
Social Relationships <i>M (SD)*</i>	26.76 (3.85)	31.86 (2.92)
% in clinical range (n)*	56(14)	14(3)
Interests <i>M (SD)</i>	30.84 (2.10)	30.12 (1.88)
% in clinical range (n)	0(0)	0(0)
Pragmatic Composite <i>M (SD)*</i>	142.20(11.84)	152.95(7.28)
% in clinical range (n) *	20(5)	0(0)

* significant at $p < .001$ (for at least 3 *SD* from the typically developing mean).

Note. No significant differences between parent and teacher ratings on CCC subscales or on the pragmatic composite for both mean and percentage in clinical range at $p < .01$.

Appendix I: Whole Sample Distribution of Clinical Range CCC Scores

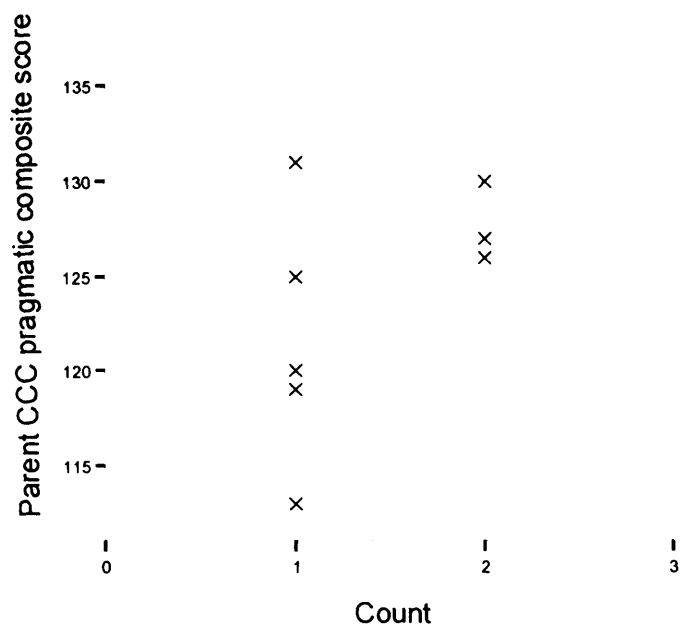


Figure 2. Distribution of clinical range parent CCC pragmatic composite scores.

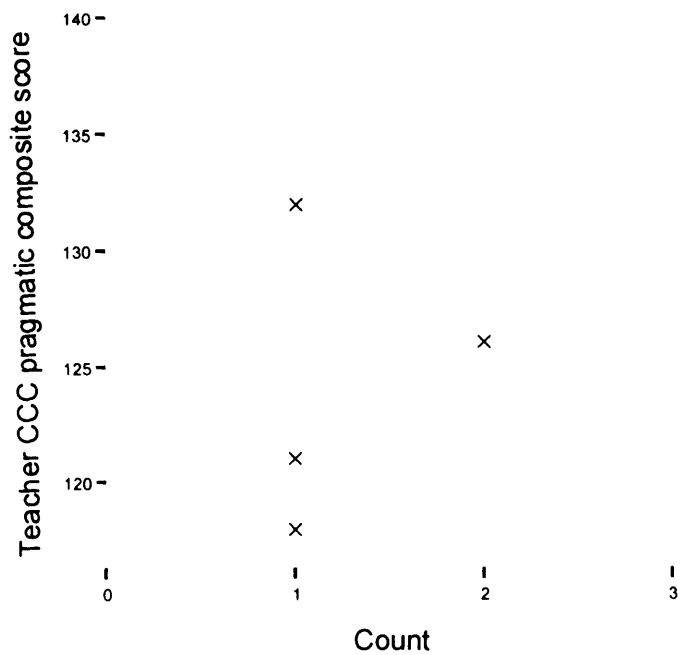


Figure 3. Distribution of clinical range teacher CCC pragmatic composite scores.

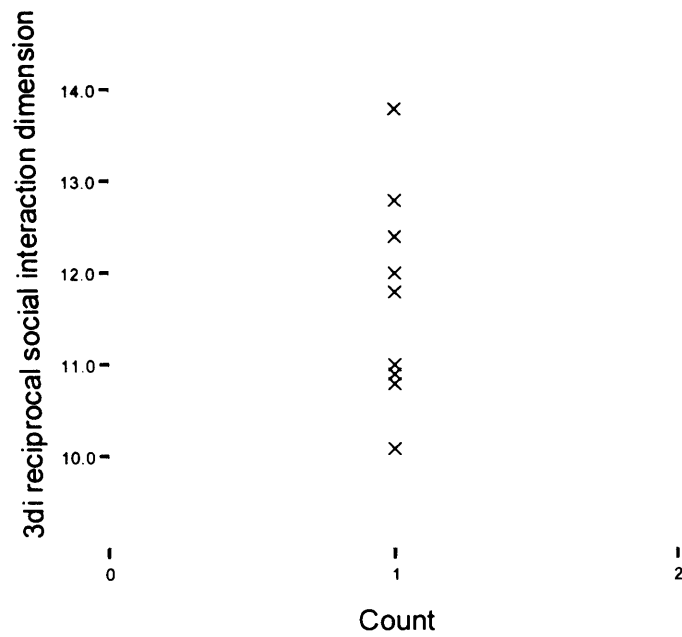
Appendix J: Whole Sample Distribution of Clinical Range 3di Scores

Figure 4. Clinical range 3di reciprocal social interaction scores.

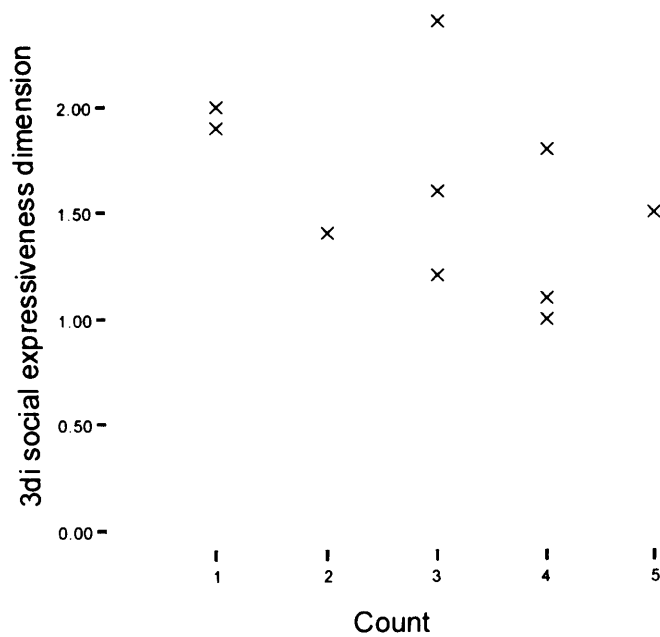


Figure 5. Clinical range 3di social expressiveness scores.

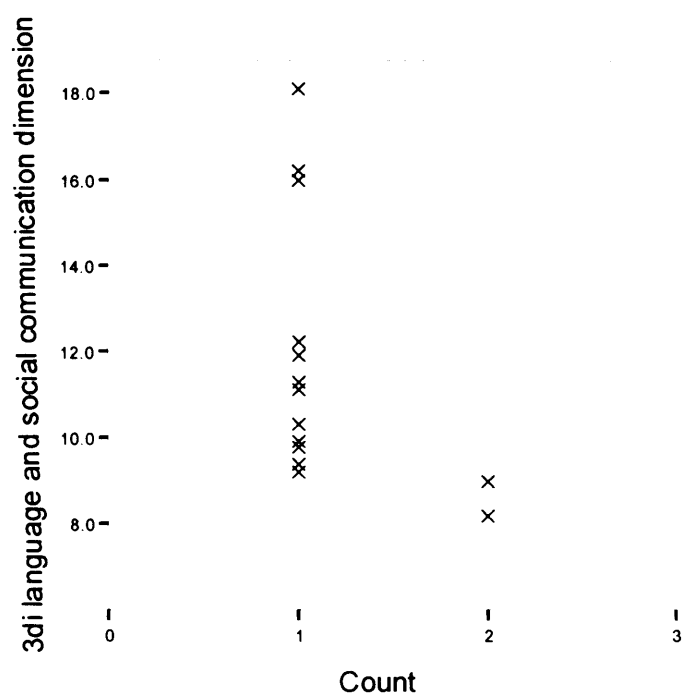


Figure 6. Clinical range 3di language and other social communication scores.

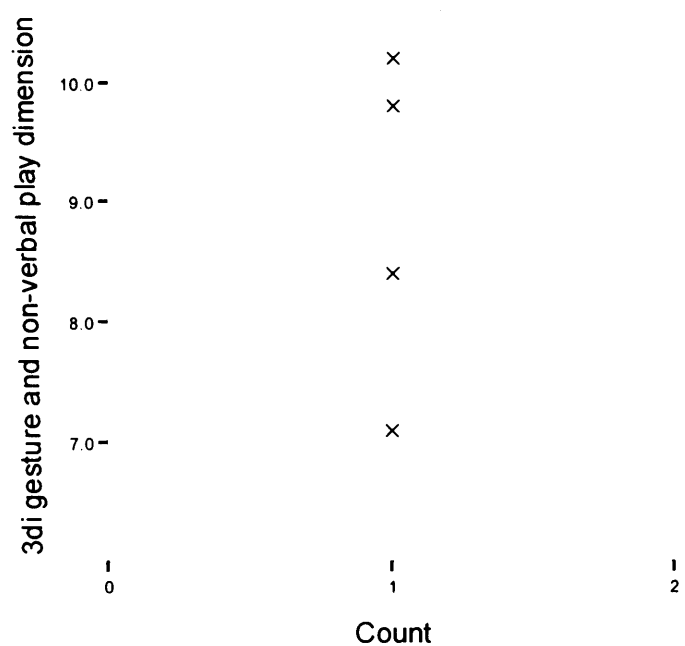


Figure 7. Clinical range 3di gesture and non-verbal play scores.

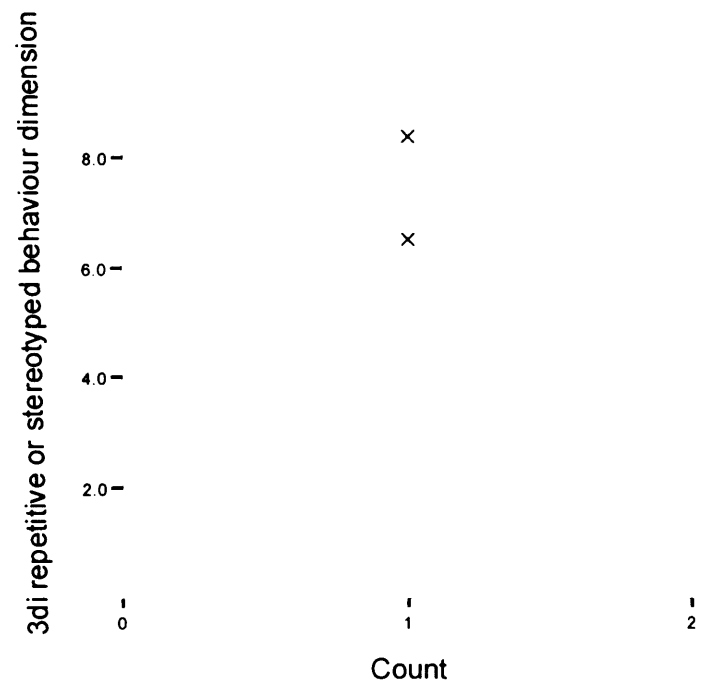
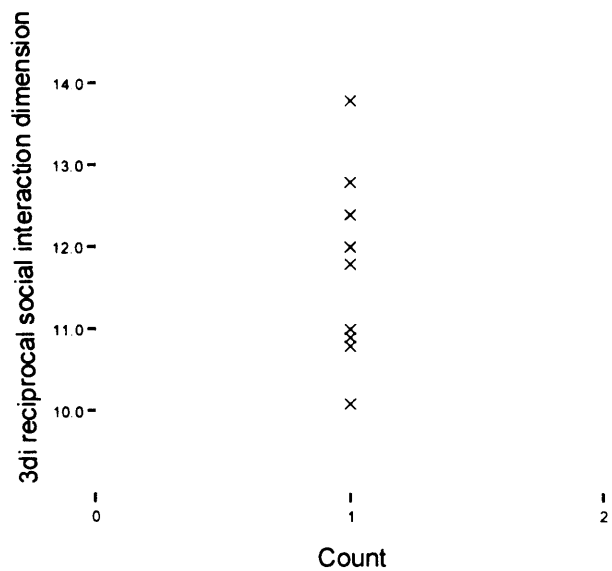


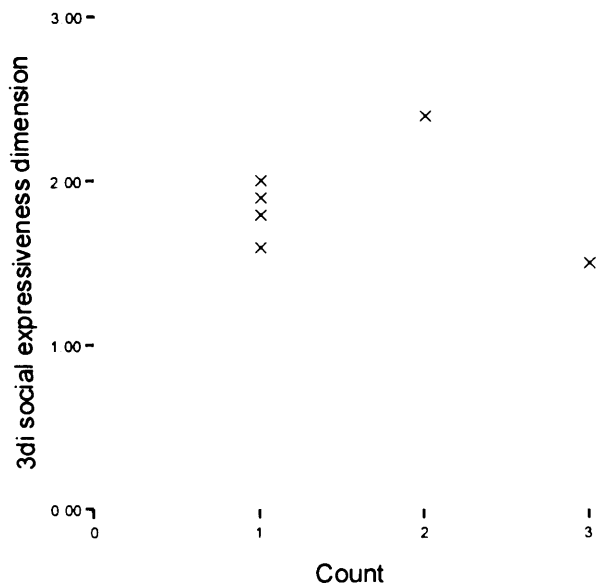
Figure 8. Clinical range 3di repetitive or stereotyped behaviour scores.

Appendix K: Distribution of 3di Scores for Children With a PDD



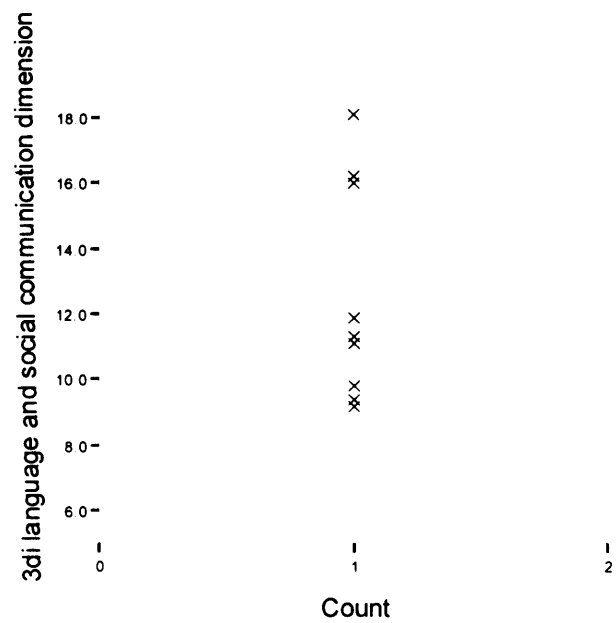
Note. Clinical cut-off > 10 for reciprocal social interaction dimension

Figure 9. 3di reciprocal social interaction scores for children with a PDD.



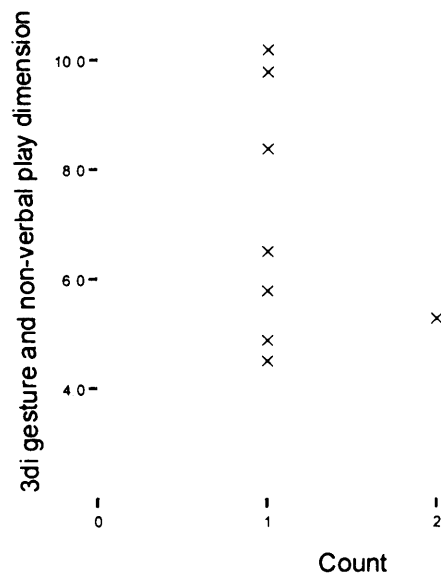
Note. Clinical cut-off > 1 for social expressiveness dimension

Figure 10. 3di social expressiveness scores for children with a PDD.



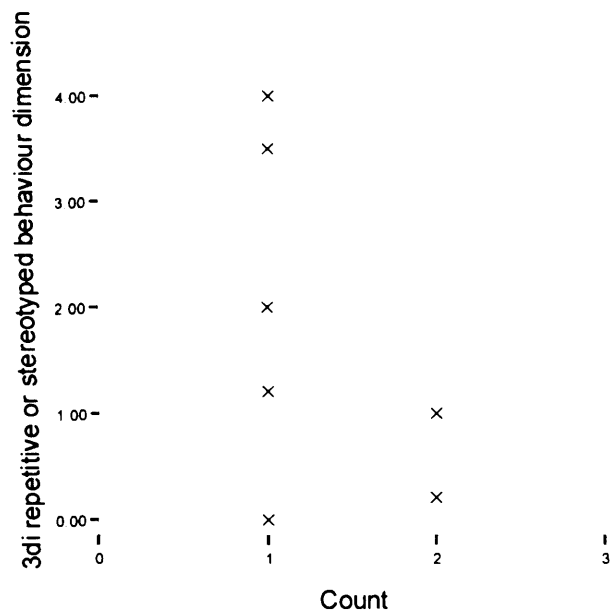
Note. Clinical cut-off > 8 for language and social communication dimension

Figure 11. 3di language and social communication scores for children with a PDD.



Note. Clinical cut-off > 7 for gesture and non-verbal play dimension

Figure 12. 3di gesture and non-verbal play scores for children with a PDD.



Note. Clinical cut-off > 3 for repetitive or stereotyped behaviour dimension

Figure 13. 3di repetitive or stereotyped behaviour scores for children with a PDD.