Investigation into the Prevalence of Sensory Processing Difficulties in Children Identified as Having Behavioural, Emotional or Social Difficulties at School.

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Abstract

The incidence of sensory processing difficulties (SPDs) was investigated for pupils (aged 4-10 years old) with behavioural, emotional or social difficulties (BESD). Teachers provided a measure of BESD using The Strengths and Difficulties Questionnaire. Parents completed The Short Sensory Profile (SSP) and teachers completed The Sensory Profile, School Companion (SC). Data were analysed for 144 children. When total scores were calculated for the sensory measures, parents and teachers rated that 55% and 44% of the sample respectively, had sensory processing difficulties. Both parents and teachers demonstrated concerns about difficulties with overactivity, poor listening and concentration skills. Associations were found between SPDs and some background factors including anxiety and poor peer relations. When individual cases were examined, it was found that children were often rated as having difficulties at school but not at home or visa versa. The implications of this finding are discussed in relation to previous studies that have purely relied on the Short Sensory Profile, a brief parental measure of SPDs. It was cautiously concluded that the data suggest that within the BESD sample it was possible to identify a subgroup of children who may also have difficulties with sensory processing. It is suggested that it may be helpful for there to be an increased awareness of possible sensory difficulties for some BESD children among educational psychologists.

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Abbreviations

Abbreviation	Full Term
ADHD	Attention Deficit Hyperactive Disorder
ASD	Autistic Spectrum Disorders
BESD	Behavioural, Emotional and Social Difficulties. NB. In the context of this research BESD is used to refer to Behavioural, Emotional **and/or** Social Difficulties.
DCD	Developmental Coordination Disorders
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders IV
DSM-V	Diagnostic and Statistical Manual of Mental Disorders V – due to be printed in 2013
EBD	Emotional and Behavioural Difficulties
EEG	Electroencephalography
EP	Educational Psychologist
ERP	Event Related Potential
IMD	Index of Multiple Deprivation
OT	Occupational Therapist
PBST	Primary Behaviour Support Team
SC	Sensory Profile School Companion (sensory measure provided by teachers)
SDQ	Strengths and Difficulties Questionnaire
SENCo	Special Needs Coordinator
SMDs	Sensory Modulation Difficulties
SOR	Sensory Over-responsivity
SPDs	Sensory Processing Difficulties
SPM	Sensory Processing Measure
SPSS	Statistical Package for the Social Sciences
SSP	Short Sensory Profile (sensory measure provided by parents)
VT	Vagal Tone. Low baseline vagal tone is associated with SMDs.

Chapter 1

Introduction

An interest in sensory processing difficulties was initiated by a number of observations made while working with children with behavioural difficulties at school. Teachers commented that they were confounded by the behaviour of certain children, for example when a generally anxious and withdrawn child lashed out with no warning in the lunch queue. Similarly a generally co-operative boy was observed to employ extreme tactics to ensure that he did not have to join the rest of the school in the hall for assembly or lunch. During assessment he begged to be able to use a biro rather than a pencil due to the scratching noise that the pencil made on the paper and also asked for the batteries of the clock to be removed so that the 'terrible ticking' would stop. It was observed that another pupil was repeatedly reprimanded by his mother and teacher for ruining his uniform and school equipment. His teacher stated '*It is disgusting the way he chews everything. Why does he behave like a toddler when he is 8 years old? I simply don't understand it'*. It was this last comment that confirmed the realisation that there was a need to investigate the sensory needs of children with behavioural, emotional or social difficulties (BESD), which in turn might lead to a better understanding of their behaviour.

Children with BESD can cause considerable concern and, at times, frustration to teachers as their needs may require substantial adult intervention and flexible approaches in order to successfully support them within school (Beaman, Wheldall & Kemp, 2007). For many BESD pupils support may be sought from an educational psychologist (EP). Hence a clear understanding of the needs of BESD children is directly relevant to the role of the educational psychologist.

A literature search into sensory processing difficulties demonstrated that sensory processing theory provides a convincing theory of the behaviours listed above. It is proposed that some children have difficulties regulating their levels of arousal and may be either over-sensitive or under-sensitive to sensory stimuli (Dunn, 1999). Hence an oversensitive child would be likely to find the world very intense and might consider everyday sensory inputs, such as the noise in the school hall, intolerable

(Williams, & Shellenberger, 2008), whereas other children need a high level of sensory input in order to be able to concentrate. They may become accustomed to gaining the necessary input through habits such as chewing, rocking or fiddling (Murray-Slutksy & Paris, 2005). This theory appears to be very relevant to certain children with BESD, but there is no evidence relating to how many children with BESD may experience sensory processing difficulties.

1.1 Sensory Processing in Typical Children

Before investigating sensory processing difficulties (SPDs) it is necessary to summarise the theory of typical sensory processing. The term ‘sensory processing’ refers to the body’s ability to register a sensory input and interpret the information so that an appropriate response is made (Mangeot et al. 2001). For example when a child sees his mother, light enters his eyes. The child’s brain interprets the visual information and recognises his mother smiling at him. The child responds appropriately by smiling back.

It is proposed that humans have seven different senses (Miller, Anzalone, Lane, Cermak & Osten, 2007) as described below. The following descriptions of the seven senses are summarised from Dunn (1999); Dunn (2006); Kranowitz (1998); Murray-Slutsky & Paris (2005); Williams & Shellenberger (2008); and Children’s Development Team (2006).

a) **Sight / Visual Processing**: The eyes detect light which the brain interprets to enable understanding of what is seen in the world around. Visual information is mentally organised so that humans are able to identify differences and similarities and remember visual pictures and patterns through visual memory. It is suggested that a small percentage of children are overly distracted by visual input and find it hard to concentrate in cluttered or brightly decorated rooms (Children’s Development Team, 2006).

b) **Hearing / Auditory Processing**: Human ears register noise all the time. Good auditory skills greatly aid the ability to develop speech, follow verbal instructions and the development of phonic skills during literacy acquisition (Murray-Slutsky & Paris, 2005). Heller (2003) comments that the current world is much noisier than it used to be when our ears were designed thousands of years ago. It is proposed that some children find it difficult to ignore background noise to focus on what the teacher is saying. Certain children may find particular noises unusually unpleasant or alternatively do not ‘tune in’ to what is being said and hence do not respond to instructions (Dunn, 2006).

c) **Smell / Olfactory Processing**: Smell and taste are closely linked; for example it is more difficult to taste food when experiencing a blocked nose. Certain children may be very sensitive to particular smells that are not really noticed by other people (Henry, Kane-Wineland & Swindeman, 2010).

d) **Taste / Oral Processing**: Taste is obviously hugely important during eating and drinking. However it should be noted that the mouth is also very sensitive to touch. Some children are reported to be sensitive to the texture or temperature of food. Babies use their mouths to explore the world by chewing and licking most objects within reach. Some older children continue to feel the need to explore the world by chewing, tasting or licking objects (Murray-Slutsky & Paris, 2005).

e) **Touch / Tactile Processing**: Constant information is received through the skin (Heller, 2003). The main function of the tactile system is to protect the body by receiving information about pressure, vibration, temperature and pain. It is usual for the brain to ignore irrelevant tactile stimuli. For example most people are aware of the feel of their clothes when they first put them on, but soon stop noticing them unless the clothes are uncomfortable. Some individuals are more sensitive to touch than others and may for example be overly irritated by clothing labels (Henry et al. 2010). Unexpected light tickly touch may be perceived as threatening (for example it could indicate an insect crawling up the arm). In contrast deep touch or firm pressure is usually calming, for example massage (Dunn, 2006).

f) **Vestibular Processing**: The vestibular system consists of fluid within the inner ear and tells the body where the head is in relation to the ground. The system enables interpretation of information about movement and balance. The vestibular system provides evidence about how fast the body is moving and helps to co-ordinate the body and eye movements in relation to the head (Williams & Shellenberger, 2008). Some children love being thrown up in the air and whirled round and round, others are terrified when their feet leave the ground. Children with sensitive vestibular systems are thought to be susceptible to travel sickness (Kranowitz, 1998).

g) **Proprioception (Kinaesthesia)**: This is the information that the body receives from muscles and joints during movement. It enables the brain to know the location of the person's arms and legs without looking and to have a good awareness of where the body is in relation to objects in the environment. Proprioceptive input is thought to be calming; hence exercise can be a good way to calm down (Henry et al., 2010). Some children do not receive enough feedback from proprioceptive input and so appear clumsy due to poor awareness of where their body is in relation to other objects.

Some theorists also discuss an eighth sense called interoception which is associated with sensations of the internal organs. '*It regulates functions such as heart rate, hunger, thirst, digestion, body temperature, sleep, mood, and state of arousal'* (Kranowitz, 1998, p 41).

The body receives information from these seven or eight possible sources. In order to function effectively it is necessary to integrate information from all the senses so that a coherent understanding of the world and how our body moves within the world is achieved (Miller et al., 2007). This process was termed sensory integration by Dr Jean Ayres (1963). For example, when riding a bicycle the brain registers information about balance from the vestibular system, while receiving proprioception from muscles and joints as the legs operate the pedals and the arms steer. At the same time the tactile system will be aware of the feel of the person's clothes, the bike seat and the texture of the handle bars etc. The ears are listening for traffic and the eyes scanning the road for dangers, which enable the cyclist to pick the best route to avoid potholes. All these pieces of information are effectively integrated in the brain to enable the cyclist to safely negotiate a route in a co-ordinated fashion.

A baby's genes provide the blueprint for development, however typically developing children also learn through experience (Sheridan, Sharam, & Cockerill, 2007). Babies are born with an inborn desire to communicate with others and explore their surroundings (Kinnealey & Miller, 1993). Babies will attend to their environment and develop an awareness of a range of sensations including the feel of their clothes, being rocked and cuddled as well as experiencing noise and light etc. The vestibular system is stimulated when babies are picked up and rocked (Ottenbacher, 1983). Most children find firm pressure calming, such as when cuddled by a parent (Dunn, 1999). Oral stimulation also tends to be calming, as is seen when a baby suckles or uses a dummy. Young children rely heavily on their sense of touch to learn about the world. Hence babies will grasp objects, look at them and put objects in their mouth which is extremely sensitive to touch (Murray-Slutsky & Paris, 2005). The brain then assimilates the information provided by the different senses to form a picture of the object, based on how it looks, the texture, weight, taste etc. Toddlers like to actively interact with the world. Play is the child's work. In order to develop a wide range of skills it is proposed that small children need to be cuddled and rocked (Ottenbacher, 1983). They also need to crawl, climb, run, experiment, fiddle, chew, grab, squash, watch, listen, smell etc. because brain development benefits from a range of varied experiences (Diamond, Krech & Rosenzweig, 1964). Even school age children may still rely heavily on their sense of touch when learning new skills (Murray-Slutsky & Paris, 2005). It is suggested that experiencing the wide range of sensations on offer in the world is not only typical for young children, but actually an essential aspect of development.

1.2 Sensory Processing Difficulties (SPDs)

It is proposed that some children do not process sensory information in a typical way (Dunn, 1999). Such children may present a wide range of troubling behaviours depending on the nature of their sensory processing difficulties (SPDs). Dunn (1999 & 2006) proposed that children who have sensory processing difficulties tend to fall into two camps, those that over-respond to sensations and those that under-respond. Children with a high threshold for noticing sensations often experience poor registration, meaning that many sensations go unnoticed, and indeed these children may bump into furniture and engage in very rough play and yet hardly seem to register discomfort. Certain children in this group actively seek sensation to remain alert because they are not receiving enough information from their senses. Sensation seekers may be observed to endlessly fiddle, chew or fidget etc. Dunn goes on to explain that conversely, other children have a very low threshold for sensations and so may be very sensitive to sensory input. These children may find loud noises distressing or be particularly fussy about scratchy clothes or strong flavoured food for example. Some children in this group go to considerable lengths to avoid sensations which they find intolerable. Hence they may refuse to take part in certain activities or lash out in order to escape from a situation that they feel is unbearable. Williams & Shellenberger (2008) demonstrate how such behaviour may be misunderstood in the following scenario.

> *'If a child is standing in line at school and is touched from behind, however, it is not appropriate to react by hitting, running away or crying hysterically. What happens at this point? The teacher approaches and says, "You know the rules! Why did you hit another student?" the child is not able to say, "I do know the rules, but my brain perceived personal danger in response to this sensory input and decided, in error, to send messages to my autonomic nervous system to prepare my body to go into flight, fright or fight for protection" '* (2008, p 1.10).

Understandably inappropriate behaviour may be very problematic at school. To complicate the situation further, it is suggested that children with sensory modulation difficulties (SMDs), (a subcategory of sensory processing difficulties), have difficulties regulating their levels of arousal and so may fluctuate from one extreme to another (Murray-Slutsky & Paris, 2005). This means that at one time they may actively seek sensations but on another occasion they may become overloaded and start avoiding sensations. As a result, understanding sensory processing difficulties requires considerable specialist knowledge and experience because children may display similar behaviours but for very different reasons. For example, a restless fidgety child may be assumed to be sensory seeking and hence need lots of sensory input. However, a very anxious oversensitive child may also appear fidgety due to anxiety and difficulties concentrating in a noisy and busy environment. Please see section 2.1 for further information on SMDs.

The theory of sensory processing suggests an alternative hypothesis for the cause of a wide range of behaviours that are commonly seen in schools and may lead children to be identified as having BESD. Challenging behaviour may interfere with the learning of both the child with difficulties and of the other children in the class. So investigating the possibility that some troublesome behaviour may have a sensory cause is relevant to the role of the educational psychologist in supporting children to effectively learn at school. However, a review of the literature suggests that no research has investigated the prevalence of sensory processing difficulties among children who were rated by the schools as having BESD.

1.3 Outline of the Study

A literature review was undertaken to investigate the development of theories of sensory processing and also to examine the research evidence relating to the theory. Research investigating the prevalence of SPDs in children with specific diagnoses such as Autism Spectrum Disorders (ASD), Fragile X Syndrome and Attention Deficit Hyperactive Disorder (ADHD) is discussed. The evidence is reviewed, as are the two studies which have investigated the prevalence of SPDs in the general population. The links between SPDs and behaviour difficulties are considered before providing a general overview of BESD within the UK and how such difficulties impact on children's education. It is concluded in the literature review that no study to date has examined the prevalence of SPDs in children who are identified by schools as having BESD. Hence this study aims to investigate whether SPDs are a concern for a substantial proportion of the BESD children in this sample or only present in a small number of cases.

A total of 39 schools were asked to nominate pupils with BESD. Parents of the nominated children were asked if they consented to take part in the study. If they agreed, teachers completed The Strengths and Difficulties Questionnaire to provide a measure of the child's BESD. Both parents and teachers completed a sensory questionnaire. The percentage of children found to have difficulties on the sensory questionnaires was calculated. Considerable numbers of children with BESD in this study were found to have SPDs. The implications of this finding for children, schools and educational psychologists are discussed. Finally a number of suggestions for future research are made.

It should be noted that formal diagnosis of Sensory Processing Disorder usually requires detailed assessment by an occupational therapist. Therefore, the term 'sensory processing difficulties' (SPDs) is cautiously used to report results in this study. It should be emphasised that sensory difficulties identified by the Sensory Profile (the sensory measure used in this study) do not constitute a formal identification of Sensory Processing Disorder. For further discussion of the use of the terms Sensory Processing Disorder and Sensory Processing Difficulties please see section 5.1.1.

Chapter 2

Literature Review

A literature search was undertaken using PsycINFO, ERIC (Educational Resources Information Centre) and Google Scholar. The following key words and phrases were used in different combinations: Attention Deficit Hyperactive Disorder, ADHD, ASD, attention, auditory, Autism, Autistic, behavioural, BESD, children, defensive, difficulties, disorder, dyslexia, dysfunction, EBD, education, efficacy, emotional, integration, integrative, over-responsive, physical activity, prevalence, processing, school, sensory, SIT, social, and tactile.

A literature search using the key terms listed above revealed a dearth of research into SPDs in the field of educational psychology. No articles relating to sensory processing were found in journals dedicated to educational psychology including '*Educational & Child Psychology'*, '*British Journal of Educational Psychology'*, '*Educational Psychology in Practice*' and '*Educational Psychologist*'.

The only reference to sensory needs found in educational psychology literature is a volume of Educational & Child Psychology which included seven articles on 'Children and young people with sensory impairments'. However the editorial of this volume clearly states that the term 'sensory impairments' refers to 'impairments in hearing and vision' (MacKay, 2010 p5). Six of the articles are about hearing impairment and one article discusses visual impairment. None of the articles reflect on possible difficulties with the other senses (e.g. touch, vestibular, proprioception, smell & taste) or possible difficulties children may have in regulating their responses to sensory input.

Difficulties caused by sensory sensitivities are touched on by Barrett (2006) in Educational Psychology In Practice, where he comments on an account given by a pupil with Asperger's Syndrome saying '*When Kenneth, aged 11 described his classmates' voices as sounding like "Dynamite going off in my ears" the teachers and teaching assistants sat up and listened'* (p 95). This clearly describes a boy who is very sensitive to noise. However the article goes on to discuss the value of autobiographical accounts in education and does not reflect on issues surrounding sensory processing.

Hence the literature relating to sensory processing that is reviewed here comes largely from the field of occupational therapy with some contributions from clinical psychology and neuroscience. A summary of the key findings of the literature is provided below.

2.1 Historical Overview of Sensory Integration Theory

Dr Jean Ayres first coined the term *sensory integration dysfunction* in 1963 (Ayres, 1963) due to her observations of difficulties some children seem to experience. Ayres was trained as an occupational therapist, a psychologist and had postdoctoral training as a neuroscientist (Miller et al., 2007). Ayres defined sensory integration as the ability to effectively organise the sensory information that we use: '*It is a neurological process that enables us to make sense of our world by receiving, registering, modulating, organizing, and interpreting information that comes to our brains from our senses'* (Pollock, 2009, p 6).

The theory of sensory integration dysfunction was originally based on work with children with disabilities (Kinnealey & Miller, 1993). Ayres proposed that some children experience impairment in their ability to process sensory information which results in difficulties being seen in a number of areas. For example, children may experience problems with attention, organisation, regulating their emotions, learning and participating in positive social interactions (Ayres, 1972). As stated by Kinnealey & Miller (1993):

> '*Ayres' work provided a unique perspective and constitutes one of the major theoretical frameworks of occupational therapy. The theory reflects her background in the neurosciences, psychology, and occupational therapy. She related neurophysiological processes to functional ability and behaviour and developed postulates about the relationship between sensory input and brain development with the goal of changing the child's neuromotor efficiency and capacity.'* (p 475)

The theory of sensory integration is based on the following five assumptions:

1. There is plasticity within the central nervous system, hence it is possible to change the brain through interventions based on sensory integration theory;
2. The sensory integrative process occurs in a developmental sequence;
3. The brain functions as an integrated whole but is composed of systems that are hierarchically organized;

4. Integration of the senses is required to produce adaptive responses and practice in producing adaptive responses encourages the development of sensory integration;
5. Children possess an inner drive to develop sensory integration, which is demonstrated through participation in sensorimotor activities.
   (Kinnealey & Miller, 1993).

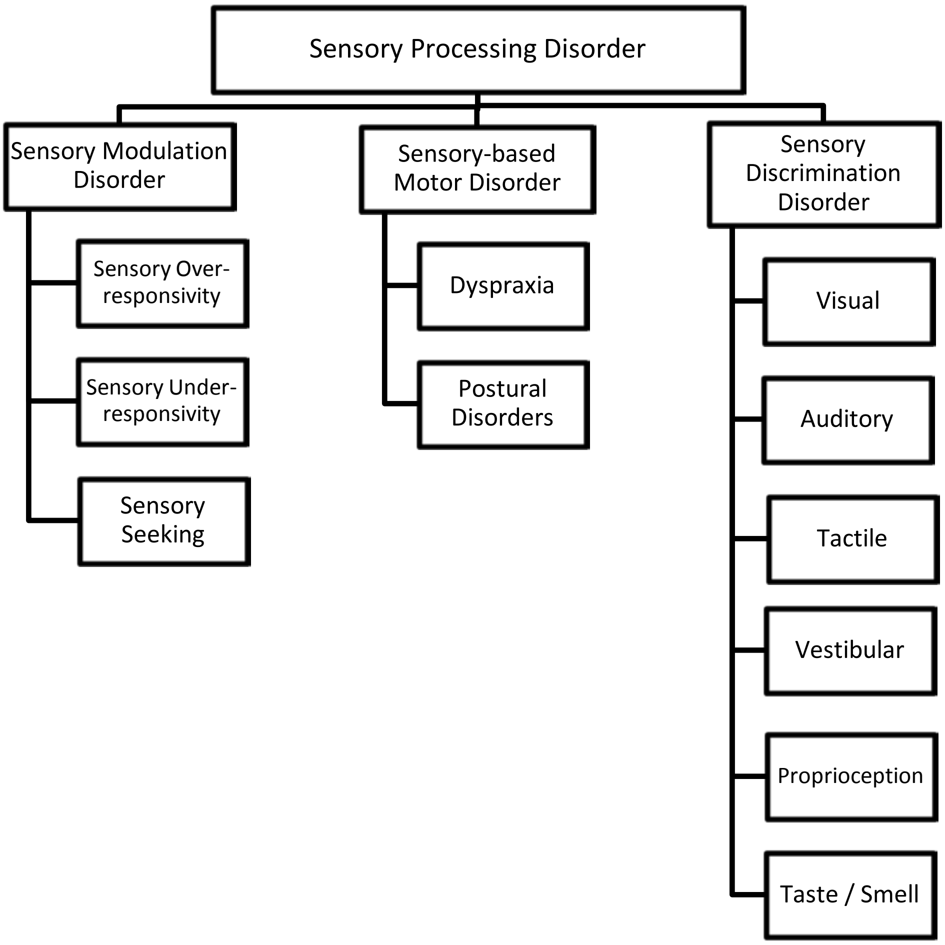
Ayres developed tools to assess sensory integration in children. Originally the Southern Californian Sensory Integration Test was used, but this was superseded by the Sensory Integration and Praxis Test which was developed in 1989 and is still used today (Kinnealey & Miller, 1993).

Ayres' original theory has been further developed by a range of scholars particularly in the field of occupational therapy. The further development of Ayres' ideas has led to some divergence in theory and practice around sensory integration. In 2007 there was a move to trademark the term Ayres' Sensory Integration© to distinguish Ayres' original theory from other sensory approaches (Pollock, 2009). There was also some confusion between the term sensory integration as used by occupational therapists and neuroscientists. For the latter, the term sensory integration refers to a neurophysiological cellular process where signals from two or more senses are combined in the central nervous system (Davies & Gavin, 2007), rather than a behavioural response to a sensory input as proposed by Ayres (Miller et al. 2007).

To establish clarity, the term Sensory Processing Disorder was proposed by Miller et al. (2007) as a new diagnostic label in 2007 which included several sub-categories as shown in the diagram below.

Figure 1:

The Sub-categories Included in Sensory Processing Disorder.



Miller et al. (2007) stated that a benefit of the proposed structure was that it identified different diagnostic subtypes. It was noted that:

> ‘*Diagnostic subgroups within sensory integration dysfunction encompass immense individual differences in detecting, regulating, interpreting and responding to sensory input. We propose that a diagnosis of SPD [sensory processing disorder] be made if, and only if, the sensory processing difficulties impair daily routines or roles’.* Miller et al. (2007, p 136).

The new term Sensory Processing Disorder effectively distinguishes the disorder from both sensory integration theory and interventions such as sensory integration therapy. The main focus of this study is on sensory modulation difficulties (SMDs) because the behaviours predominantly associated with being unable to regulate levels of alertness are likely to be problematic in class. Also, sensory-based motor disorders require assessment and remediation of children's physical abilities which is outside the area of expertise for most educational psychologists.

While occupational therapists regularly refer to Sensory Processing Disorder as a diagnostic category, it is not included in the Diagnostic and Statistical Manual of Mental Disorders (DSM IV). However, it is possible that Sensory Processing Disorder will be included in the updated version of the Diagnostic and Statistical Manual of Mental Disorders (DSM V) which is due to be published in May 2013. Sensory Processing Disorders have been included in three diagnostic classification references: The *Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood, Revised*; *The Diagnostic Manual for Infancy and Early Childhood*; and *The Psychodynamic Diagnostic Manual* (Miller et al., 2007). Hence, Miller et al., argue that Sensory Processing Disorder is increasingly gaining recognition outside the field of occupational therapy. However, Pollock (2009) reports that some professionals question whether Sensory Processing Disorder should be considered to be an independent diagnosis and they suggest that difficulties with sensory processing may always be associated with other issues such as anxiety and diagnoses such as Autistic Spectrum Disorder. It should be noted that this study seeks to identify what proportion of a BESD sample experiences sensory difficulties. Establishing whether observed sensory difficulties might be the consequence of a specific, independent impairment in sensory processing (as suggested by the term sensory processing disorder) or the product of other issues such as anxiety is beyond the scope of this research. The literature search demonstrates that to date the vast majority of research into SPDs has taken place in America, Canada, Australia and South Africa. SPDs are less well researched in the UK.

2.2 Evidence of Sensory Processing Difficulties (SPDs)

Since Ayres developed the theory of sensory integration in the 1960s there has been a wealth of anecdotal evidence about children who have difficulties processing sensory information. Ayres developed the Sensory Integration and Praxis Test (Kinnealey & Miller, 1993) which provided occupational therapists with a formal way of assessing SPDs. Other screening tools have been developed such as the Sensory Profile developed by Dunn (1999) and more recently the Sensory Processing Measure which was published in 2007 (Parham & Ecker, 2010). Such standardised materials enable detailed sensory information to be collected about children, which is combined with thorough observations usually by an occupational therapist before an identification of Sensory Processing Disorder or SPDs is made. Observations and questionnaires rely on interpreting a child's behaviour whereas recently research has taken place to try to establish SPDs through scientifically measuring responses to stimuli.

2.2.1 Direct Measurement of Sensory Responses.

As shown above SPDs may include a wide range of different subgroups. Sensory processing theory suggests that children with sensory difficulties may be either oversensitive or under-sensitive to any of the senses (Dunn, 1999). Ayres observed children who found certain types of touch unusually uncomfortable or unpleasant so that they felt the need to escape the situation. She called this difficulty 'tactile defensiveness' (Ayres, 1962). It is thought that the main problem with over-responsiveness is an inability to ignore irrelevant stimuli combined with an inappropriately large reaction to those stimuli (Schneider et al., 2008). Parush, Sohmer, Steinberg & Kaitz (2007) studied children's responses (by measuring somatosensory evoked potentials) to small electrical stimuli applied to the skin on the wrist. Three groups were tested: typically developing children (n=60); children identified as having ADHD (n= 21); and children with ADHD who had also been identified (via a parental questionnaire) as having tactile defensiveness (n=46). The study found that children with tactile defensiveness could be distinguished from the other two groups as a result of larger responses to the stimuli. The authors state '*the present data support claims that TD [tactile defensiveness] is a discernible entity, marked by anomalous physiological responses to somatosensory stimuli*' (Parush et al., 2007, p 557.) Hence this study provides physiological evidence of parental observations of tactile over-responsiveness.

McIntosh, Miller, Shyu & Hagerman (1999) found that children with sensory modulation difficulties showed greater magnitude and frequency of electrodermal responses. Electrodermal responses are changes in the electrical conductivity of the skin and occur when a person is startled or feels aggressive or defensive (Mangeot et al., 2001). Similar results were found by Miller et al. (1999) when comparing electrodermal response measurements for children with Fragile X Syndrome (see section 2.6.1) with typical controls. Hence this also provides evidence that children with SPDs over-respond and continue to respond to stimuli again and again rather than being able to filter out irrelevant stimuli.

Davies and Gavin (2007) investigated the brain processes of 25 typically developing children and 28 children assessed as having SPDs. The authors theorised that children with SPDs would have different brain activity from typical children. Electroencephalography (EEG) allows brain activity to be measured by placing small sensors on the scalp. In addition to measuring EEG, event-related potentials (ERP) were used to show the brain's activity in relation to a specific event. Davies and Gavin (2007) found that children with SPDs were less able to suppress repeated or irrelevant stimuli than typical children (p=.04). It was noted that:

> '*the decreased ability of children with SPD [sensory processing disorder] to gate out or suppress irrelevant auditory stimuli, as shown in this study, may explain certain behavioural manifestations such as distraction, impulsiveness, abnormal activity level, disorganisation, anxiety, and emotional liability, often observed in children with SPD'* (Davies & Gavin, 2007 p 186).

It was also found that typically developing children showed better abilities to suppress irrelevant stimuli as they matured, whereas the skills of children with SPDs did not improve with age. In addition, children with SPDs showed much more variation in their responses to auditory stimuli, which the authors interpreted as a demonstration of the disorganised patterns of brain activities that Ayres hypothesised.

It was concluded that differences in brain activity correctly distinguished typically developing children from those with SPDs with 86% accuracy. Subsequent studies found that SPDs were identified by differences in brain activity with 96% accuracy (Davies, Chang & Gavin, 2010), and with 79% accuracy (Gavin, Dotseth, Roush, Smith, Spain & Davies, 2011). These data indicate that of the samples of children, who had been identified by professionals as having SPDs as a result of the way they behaved, a high percentage could also be identified by measuring the pattern of their brain activity. This lends weight to the suggestion that SPDs could be recognised as a distinct diagnosis or at least that sensory difficulties observed by occupational therapists are also evident through direct measurement. It should be noted that the studies only measured functioning in the cortex, whereas it is hypothesised that much processing of sensory information takes place in the sub cortex. Also, only responses to auditory stimuli were measured, hence data on processing one type of sensory stimuli were provided, rather than measuring brain patterns of children integrating a range of complex stimuli.

Schaaf et al. (2010) investigated whether children with sensory modulation difficulties (n=43) could be distinguished from typical children (n=40) by their vagal tone (a measurement of parasympathetic nervous system activity). Although the SMDs children tended to have lower baseline vagal tone as predicted, the scores for the SMDs group as a whole was not significantly different from the typical group. However, it was found that children with the most severe sensory modulation dysfunction demonstrated significantly lower parasympathetic baseline activity and also had the poorest behavioural responses. This result possibly suggests that either the measure of vagal tone was not sensitive enough to detect SMDs or that there were no significant physiological effects in mild cases of SMDs. This leads to the possibility that some of the children, who had been identified with SMDs on the basis of their behaviour, did not actually have significant sensory difficulties.

Similarly Schoen, Miller, Brett-Green & Nielsen (2009) found differences in sympathetic nervous system functioning for children with ASD (n=38) and SMDs (n=31) and compared to typically developing children (n=33). It was found that ASD children had atypical physiological arousal in that they had significantly lower baseline arousal whereas children with SMDs had higher reactivity to the sensory stimuli. The authors concluded that it was possible to differentiate between '*children with ASD and children with SMD from typically developing children on both behavioural and physiological measures*' (Schoen et al., 2009, p 9).

Research into direct measurement of sensory processing deficits is in its infancy. However, there is some evidence to show that children with SPDs respond differently to stimuli compared with typical children. Direct measurement of responses to sensory stimuli in children with an ADHD diagnosis has led to the hypothesis that two distinct groups of children can be identified; children with ADHD and SPDs and those with only ADHD (Parush et al., 2007 and Mangeot et al., 2001). Hence, it is important to consider how many children are affected by sensory difficulties and if SPDs are associated with other conditions.

2.3 Factors Associated with SPDs

The causes of SPDs remain unknown but it is possible that it is associated with various factors. May-Benson, Koomar & Teasdale (2009) collected data on children's pre, peri, post-natal and early childhood development using a parent report questionnaire called 'The Developmental Sensory History'. The SPDs group consisted of 1000 participants that had all been diagnosed as having SPDs through clinical observations of sensory processing, postural control and motor performance as well as through assessment using the Sensory Integration and Praxis Tests, Southern California Sensory integration Tests or Miller Assessment for Pre-Schoolers. Children with known disorders, such as ASD or Fragile X Syndrome were excluded from the SPD group. Data was also collected for a second group of 467 participants diagnosed with ASD. It was found that no single factor was strongly associated with SPDs but it was established that children identified as having SPDs had an average of seven issues in the following categories: problems during the mother's pregnancy; complications during delivery; assisted delivery; birth related injury/illness; childhood illnesses or injuries; developmental problems; and delay in reaching developmental miles stones (May-Benson, Koomar & Teasdale, 2009). Hence, it is clear that there are some associations between children who have been identified as having SPDs and factors that affect child development during pregnancy, birth and through the child's early years.

2.3.1 Prenatal and Birth Difficulties

May-Benson et al. (2009) found high levels of maternal stress during pregnancy in children with SPDs. Similar findings have been found in work with rhesus monkeys, where it was found that monkeys who had been exposed to pre-natal stress (n=7) showed *'behavioural sensitization'* (Schneider et al. 2008, p 107). It should be noted that only one type of sensory processing difficulty was measured (tactile defensiveness) and the effects in this study were reported to be 'slight'. There is evidence that prenatal stress is associated with behavioural difficulties in children, for example O'Connor, Heron & Glover (2002a), Bergman, Sarkar, O'Connor, Modi & Glover (2007) and O'Connor, Heron, Golding, Beveridge & Glover (2002b). However, further evidence is needed to further support May-Benson et al.'s (2009) findings of specific links between SPDs and prenatal stress.

Another prenatal condition that has been associated with SPDs is the baby's exposure to alcohol during pregnancy. Again Schneider et al. (2008) found a relatively high withdrawal rate to repeated tactile stimulation in monkeys who had been exposed to prenatal alcohol exposure (n=9). Hyper-responsiveness to mildly painful stimuli has also been found in rats which have experienced prenatal alcohol exposure (Rogers, Barron & Littleton, 2004, cited in Schneider et al., 2008). Whereas in humans prenatal alcohol exposure is associated with difficulties with cognitive functioning, processing speed, attention, memory, motor skills and behaviour (Schneider et al., 2008; Franklin, Deitz, Jirikowic & Astley, 2008). High levels of SPDs have been found in children with a diagnosis of Foetal Alcohol Syndrome (as is discussed in section 2.4.2.)

May-Benson et al. (2009) have shown that difficulties during delivery are associated with SPDs, as children with SPDs were more likely to have experienced breech delivery, cord wrap, assisted delivery and higher birth weight than typical children. Most notably the incidence of jaundice was 3-4 times higher for children with SPDs compared to typical children. Premature delivery was not associated with SPDs but was a common factor for children with ASD (May-Benson et al., 2009).

Ben-Sasson, Carter & Briggs-Gowan (2009) suggest that low socioeconomic status may be a risk factor for SPDs due to pregnant women from poor families being more likely to be exposed to stress, violence and alcohol during their pregnancies. As discussed in section 2.8.1 low socioeconomic status has been associated with BESD (Washbrook & Waldfogel, 2011), indicating that environmental factors such as poverty, as well as possible 'within child' difficulties may contribute to observed issues such as SPDs and BESD.

2.3.2 Institutionalisation

It is theorised that children are pre-programmed to use their senses to explore the world and hence they learn to integrate their senses through having a wide range of experiences (Murray-Slutsky & Paris, 2005). Therefore, one would expect to see SPDs in children who have had limited opportunities to explore and interact with the world.

Church & Kaltenbach (1997) comment that there are critical developmental stages during which animals and humans need appropriate levels of sensory stimulation in order to achieve optimal development. For example, the first 2-3 years of life are critical for the development of hearing and language. Church & Kaltenbach noted:

> '*A hearing impairment at this age, even in an otherwise normal child is a form of sensory deprivation that can lead to permanent speech, language and intellectual deficits; cause distractibility, hyperactivity and developmental delays; and impair academic performance'* (p 495).

This observation indicates the importance of young children receiving appropriate sensory stimulation.

Unfortunately, typical levels of stimulation do not always occur, either due to children having impairments or due to environmental factors. It has been found that the institutionalisation of children (for example due to living in an orphanage) is associated with developmental delay and behavioural problems (Lin et al., 2005). In addition, research has documented a lack of sensory stimulation and opportunities for social interactions in orphanages (Casler, 1975 and Provence, 1989, cited in Lin 2005). Lin et al. suggest that:

… '*institutionalized children are deprived of opportunities for sensory exploration and interaction with a variety of environments during early childhood. As a result, they may not be able to process and utilize sensory information to guide and regulate their behaviors effectively.*' (2005, p 139)

Cermak & Daunhauer (1997) studied sensory processing of 73 children who had been adopted from Romanian orphanages compared with 72 typically developing American children. A parental report called 'The Developmental and Sensory Processing Questionnaire' was used. It was found that the Romanian children demonstrated significantly more difficulties in sensory processing in five of the six sensory domains that were assessed. They also showed significantly more difficulties with levels of activity, feeding, organisation and social emotional interactions. While this research is pertinent, it should be noted that there are probable cultural differences between the two groups of children. Also, children who have been placed in an orphanage and then adopted across the world to America are likely to have suffered considerable emotional trauma and loss which may also be detrimental to their development.

It has been found that children who have experienced early neglect in orphanages show different levels of hormone production compared to typical children (Fries, Ziegler, Kurian, Jacoris & Pollack, 2005). Even though the orphaned children in the study (n=18) had been in adoptive families for an average of three years, children still showed disruptive development of hormone systems compared to a control group (n=21). The result is a reduction in the '*calming effects that typically emerge between young children and familiar adults who provide care and protection*' (Fries et al. p 17239). This indicates that difficulties in social development persist long after children have settled into caring family environments.

2.3.3 Attachment to Caregivers

Attachment theory suggests that children will only explore the world if they feel secure (Bowlby, 1958). Hence, it is possible that the quality of attachments that children experienced in early childhood is as important as their sensory opportunities. It is acknowledged that in an orphanage, children are likely to have poor opportunities for forming successful attachments as well as deprived sensory experiences. The importance of attachment was highlighted in a study of play behaviour in toddlers with autism. Naber et al. (2008) found that the quality of the interaction between the toddler and the caregiver was closely linked to the child's development of play behaviour. It was concluded that '*Attachment quality explained play behaviour regardless of the clinical status of the children*.' (2008, p 863). Children with secure attachments showed a higher level of play and spent more time playing than those with disorganised attachments and hence had more opportunities to sample a range of sensory experiences.

Bhreathnach (2008) discusses the links between attachment difficulties and problems modulating responses to sensory input. Children who experience insecure attachment may become hyper-vigilant and only attend to sensory inputs that the child feels relate to his/her survival (Perry, 1995). Bhreathnach (2008) states that parents have a crucial role to play in helping children to regulate their emotions. In cases where children have not received adequate parenting, they have not been taught to regulate their arousal levels, which affect both their emotional and sensory responses. As stated by Bhreathnach, '*The capacity to regulate arousal states depends on how sensory information is processed that in turn is primarily influenced by attachment history'* (2009, p4).

It is suggested that environmental factors such as socioeconomic status and childhood trauma greatly affect child development and may impact on how the child processes sensory information as well as on his/her behavioural, emotional and social development (Ben-Sasson et al., 2009). Therefore, it is important to consider the environmental issues and quality of attachment relationships in children's lives when trying to support their needs. As stated by Bhreathnach (2008),

> *'Children with a significant history of trauma are frequently diagnosed as having ADHD. There is a tendency to dissociate their symptoms from their attachment history and ongoing family relationships. Their flight and fear behaviours are often misunderstood and they may increasingly become aggressive and oppositional if their emotional issues are not addressed'. (p4)*

Marsh (2011) comments on the benefits of positive touch and states that psychologists have tended to focus on the senses sight and vision and have ignored the beneficial impact of touch on children. In fact she proposes that the UK has a 'non-contact' culture where adult to child contact in school is restricted due to concerns about the potential for abuse. Over 50 years ago Bowlby observed that loving touch was instrumental in the development of secure attachment relationships (1958). Marsh reports that there are physiological responses to nurturing touch which stimulates, oxytocin, endorphins, dopamine, serotonin and melatonin to be produced and have a calming effect. This suggests that positive touch may be instrumental in helping children develop attachments, regulate their emotions and levels of alertness, and hence relevant to both BESD children and those with sensory modulation difficulties. The Importance of touch is also highlighted by Gallace (2012) who presents evidence from studies that show that

> *'Touch can affect our decisions, opinions and behaviour, even when we are not fully aware of it. It contributes to our well-being and to the maintenance of our social relationships. It also protects our body at both the physical and psychological level'*. (p899)

Gallace (2012) comments that Western society is moving towards reduced levels of social touch which is concerning because tactile interactions are important to our well-being. In addition he observes that despite the fact that touch affects all areas of our lives and impact on our behaviour and social relationships the modality has attracted little interest from researchers compared to vision and hearing.

Parush et al., (2007) also comment on the importance of touch in early life and the crucial role that appropriate touch plays in development. They state '*Recent studies have shown that the tactile experience of nonhumans and humans early in life can have long-term effects on neural functioning, the capacity to cope with stress, and emotional development (attachment, emotional regulation, exploration and learning)*' (p 554). This emphasises the fact that both attachment and physical affection are important factors in promoting optimal development in young children.

2.3.4 The Need for Environmental Complexity

The importance of a varied environment in promoting brain development has been demonstrated by studies into early rearing of animals. For example Diamond et al. (1964) found that greater brain growth is achieved by providing young animals with a variety of toys and hence a varied environment. Stein, Perrault, Stanford, & Rowland (2009) have studied the development of sensory integration using cats. It was found that initially neurones in kittens could respond to sensory inputs individually but were unable to integrate information in order to respond to multi-sensory inputs. The capacity to process multi-sensory information developed over time as a result, it is suggested, of experiencing a wide range of sensations. The authors found that they could alter the development of sensory processing in young cats by rearing them in the dark which provided evidence that environmental experience in young animals shapes the neural circuits that underlie sensory integration. Interestingly, retests at four years old showed that the adult cats no longer experienced the deficits induced when they were young, which supports Ayres' assumption about the plasticity of the brain and suggests that deficits, induced in otherwise typical infants, may be overcome with appropriate sensory input as the child develops. However, it does not provide evidence either for or against the assumption that the brains of children with learning difficulties also have plasticity.

The effects of early experiences were studied by Van den Dries, Juffer, Van Ijzendoorn, Bakermans-Kranenburg (2010) who followed up children who had been adopted from China. One group of children had been institutionalised (n=50) and the other group had been in foster care prior to adoption (n=42). Both groups were assessed two and six months after adoption. It was found that children who had been fostered performed significantly better on cognitive and motor skills than institutionalised children, indicating that institutionalisation is more detrimental to children's development (Van den Dries et al., 2010). In general it has been found that children demonstrate impressive catch up of skills following adoption, but that it is likely to take two years for them to reach age appropriate skills (Cohen, Lojkasek, Zadeh, Pugliese & Kiefer, 2008; Van Ijzendoorn & Juffer, 2006). Such findings again provide evidence of the important of environmental influences in children's development and of the ability of the brain to recover after periods of early deprivation, which suggests that children who may have developed sensory issues as a result of deprivation have a good chance of recovery, if placed in more favourable environmental conditions.

Lin et al. conclude that: *'findings suggest that the presence or absence of new learning experiences influences brain development and that a certain degree of environmental complexity is important for optimal brain development and functional behaviours*' (2005, p 140).

2.3.5 Genetic Influences

Although it has been suggested that a range of environmental issues are associated with SPDs, the identification of specific genetic and or neurological processes that underlie SPDs have thus far eluded clinicians and scientists (Stein et al, 2009). Goldsmith, Van Hulle, Arneson, Schreiber & Gernsbacher (2006) concluded that there is some indication that tactile defensiveness is more heritable than auditory difficulties during a twin study. It was found that monozygotic twins were more likely to show similar tactile difficulties than dizygotic twins. However, further research is needed to establish genetic factors in SPDs.

2.4 Prevalence of SPDs in Children with Specific Diagnoses

Early research into SPDs had a focus on pupils with learning disabilities as it was noted that sensorimotor development is atypical in many children with learning disabilities (White, 1979). SPDs have been found to be common in children diagnosed with developmental disabilities. The prevalence of SPDs within samples with particular clinical diagnoses is explored below, in order to provide a comparison of the prevalence of SPDs found in children with specific diagnoses compared with the prevalence in non-referred populations.

The Short Sensory Profile is a brief parental questionnaire that was developed from the Sensory Profile using 38 questions that were found to be particularly reliable (Dunn, 1999). The SSP has become accepted as a useful tool for research and has been used in many of the studies discussed below, such as: Mangeot et al. (2001); Baranek, Chin, Hess, Yankee, Hatton & Hooper (2002); Baranek (2002); Rogers, Hepburn & Wehner (2003); Tomchek & Dunn (2007); Franklin et al. (2008); and Gavin et al. (2011). It should be noted that research often reports prevalence of Sensory Processing Disorder on the basis of results from the SSP. The fact that the SSP was never designed to provide evidence of a formal diagnosis of Sensory Processing Disorder but only as a screening tool, should be considered when deliberating the studies that rely on the SSP as a sole measure of SPDs. In addition the SSP only briefly reports on parents views. Hence, no evidence is provided on how the child behaves at school or whether the same pattern of difficulties is reported by both parents and teachers.

2.4.1 Autistic Spectrum Disorders and Fragile X Syndrome

Autistic Spectrum Disorder (ASD) has become the most prevalent neurodevelopmental diagnosis in children (Hodgetts & Hodgetts, 2007). Difficulties with sensory processing have been well documented for pupils on the autistic spectrum (Tomchek & Dunn, 2007; Baranek, 2002; Ermer & Dunn, 1998; Dawson & Watling, 2000; and Watling, Deitz & White, 2001). For example, studies of older children with ASD have reported that 42-88% of the ASD population have unusual sensory responses (Baranek, 2002). Tomchek & Dunn (2007) studied the prevalence and pattern of SPDs in 281 children with ASD compared with 221 typically developing peers. It was found that 83.6% of the ASD population had a ‘definite difference’ on the SSP which indicates that their scores were greater than two standard deviations away from the mean. By comparison only 3.2% of typically developing pupils scored with a ‘definite difference’ on the SSP (Tomchek & Dunn, 2007). The research also confirmed a pattern of sensory processing for pupils with ASD, with significant difficulties noted in inattention / distractibility. The three sections on the SSP where the greatest percentage of ASD children showed difficulties were ‘Seeks Sensation’ (86% compared to 6% of typical children); ‘Auditory Filtering’ (78% compared to 3% of typical children); and ‘Tactile Sensitivity’

(61% compared to 9% of typical children). This study, which shows very high levels of SPDs in children with ASD, is in line with other research studies e.g. Crane, Goddard & Pring (2009); Kern et al. (2006); Kern et al. (2007); and Liss, Saulnier, Fein & Kinsbourne (2006). In fact some authors (e.g. Kern et al., 2007) have concluded that SPDs are so closely related to ASD that they ought to be considered to be part of the disorder.

Rogers et al., (2003) also found high levels of SPDs in ASD children by using the SSP on four groups of children: ASD (n = 26), Fragile X Syndrome (n = 20), children with a variety of developmental disabilities (n = 32), and typically developing children (n = 24). Both the ASD and Fragile X Syndrome groups were found to have significantly more sensory difficulties than the control groups over all, particularly in the areas of tactile sensitivity and auditory filtering. It was also found that children with autism were more abnormal in responses to taste and smell than all other groups. Similarly Baranek et al. (2002) found that 73% of children (n=15) with full mutation Fragile X Syndrome were found to have SPDs.

2.4.2 Foetal Alcohol Syndrome

Franklin et al. (2008) studied patterns of sensory processing and behaviour in 44 children with a diagnosis of Foetal Alcohol Syndrome, which occurs in approximately 4% of children born to alcoholic women (Church & Kaltenbach, 1997). Franklin et al. (2008) found that 72.7% of the children had SPDs (as measured by the SSP). There was a high correlation between children with SPDs and observed behaviour difficulties with 84% of children being rated as having both SPDs and behaviour difficulties.

2.4.3 Attention Deficit Hyperactive Disorder (ADHD)

ADHD is a well known and prevalent medical diagnosis of a behavioural condition (Holowenko, 1999). It is characterised by '*inattentiveness, an almost reckless impulsiveness and, in some but not all cases, a knee-jiggling, toe-tapping hyperactivity*' (Holowenko, 1999, p 14). ADHD is controversial due to the significant numbers of children with a diagnosis and the common prescription of stimulant medication to mitigate the behavioural symptoms. Some professionals have highlighted concerning side effects of stimulant medication. For example, Breggin

(2002) stated that stimulant medications '*can cause many physical problems, including cardiovascular dysfunction, growth suppression, and tics. They can also cause many serious psychiatric side effects such as agitation, aggression, psychosis, mania, depression, and obsessive-compulsive disorder'*, (p xv).

In America ADHD is thought to affect 3-6% of school-aged children accounting for roughly half the paediatric referrals to mental health services (Mangeot et al., 2001). Children with ADHD often experience significant academic and sensory difficulties (Schilling et al., 2003). Several studies have also focused on SPDs with pupils who have an ADHD diagnosis. For example, Mangeot et al. (2001) investigated SMDs in children with ADHD (n=26) and typically developing children (n=30). SMDs are apparent when children fluctuate between craving sensations and feeling the need to avoid them. Sensation avoidance often results in explosive behaviour in school as the child tries to escape situations that they perceive to be intolerable (Dunn, 1999). Mangeot et al. (2001) measured electrodermal responses when children completed a Sensory Challenge Protocol, which established their reaction to five different types of sensation. It was found that children with ADHD demonstrated significantly greater problems with sensory processing than typically developing children. It was also found that particular sensory symptoms were good predictors of challenging behaviour such as aggression (as discussed in section 5.4.1). The authors noted that there was considerable variability between individual children with ADHD and it was hypothesised that it may be possible to identify two distinct groups of children with ADHD: those with sensory difficulties and those without.

Examination of distinct sub groups of children with ADHD was undertaken by Parush et al. (2007). As mentioned in section 2.2.1, Parush et al. compared somatosensory function in three groups of boys; those with ADHD and tactile defensiveness (n=46); boys with ADHD and no tactile defensiveness (n=21); and a control group of 60 typically developing children. 69% of the ADHD sample was classed as having tactile defensiveness, based on a parental measure (The Touch Inventory for Pre-schoolers) and a Sensory Reactivity Score based on the experimenter's blind ratings of the children's behaviour. It was found that both ADHD groups differed from the typical children on most measures. The authors conclude that the study provides evidence that tactile defensiveness is a discernible entity that can be identified by exaggerated somatosensory evoked potential amplitudes.

2.5 Prevalence in the General Population

The vast majority of literature addressing the prevalence of SPDs has focused on children with particular diagnoses, for example learning disabilities, ASD, ADHD and Fragile X Syndrome. Although children with these diagnoses often have BESD, a great many children with BESD have not been diagnosed with any clinical condition. To date, no study has been undertaken into the occurrence of SPDs in children identified as having BESD at school. The high rates of incidence found among samples of children with specific diagnoses suggest that there may be a high prevalence in children with BESD and that this area was worthy of further investigation.

Very little research has been conducted on the prevalence of SPDs within the general population. Several studies have compared incidence or patterns of SPDs in children with a specific diagnosis and compared this population to typically developing children for example, Tomchek & Dunn (2007) and Rogers et al. (2003). However, in these studies the typically developing children were selected from a larger sample of children based on evidence that their development was normal, which is different from establishing prevalence within a cross section of society. Tomchek and Dunn found that for children who were classed as having no developmental difficulties, only 3.2% (n=221) were found to have a 'Definite Difference' on the SSP. Data for this control group was taken from a national study of 1,075 children who were not receiving special education services or taking regular medication.

Only two studies have been found that investigate prevalence within the mainstream population. The first, conducted by Ahn, Miller, Milberger & McIntosh in 2004, asked the parents of all incoming kindergarten children from a public school district in America to complete the SSP. As was noted in section 2.4, the SSP was only designed as a screening tool and so while the SSP provides an indication of sensory difficulties it does not provide a diagnosis of sensory processing disorder when used in isolation as is the case in Ahn et al.'s study.

Ahn et al. (2004) sent the SSP to 1,796 parents for children entering the school year in 1999-2000. 12% of children were known to some special educational services, hence it is assumed that a percentage of the pupils surveyed will have had special educational needs. 703 surveys were returned which was a 39% rate of return. The results showed that 96 children met the screening criteria for SPDs which was 13.7% of the sample. Due to the low response rate the authors calculated an estimate of prevalence by assuming that all non respondents did not have concerns about their child's sensory processing. Hence, with the assumption that all non-respondents would not have met the criteria for SPDs, a conservative estimate of 5.3% of kindergarten pupils with SPDs was calculated. It is probable that this estimate under-represents the level of SPDs. It could be argued that children who experience deprivation, neglect and behaviour problems would probably include pupils with SPDs, but such families are less likely to respond to questionnaires than more privileged families. So a prevalence of between 5.3% and 13.7% within kindergarten pupils has been indicated in this sample. However, these results need to be replicated to enable general prevalence statistics to be extrapolated with confidence. Since 2004, this study has been cited in 86 publications and is regularly quoted as being the only study into the prevalence of SPDs within the general population (Ben-Sasson et al., 2009).

Since calls have been made for homogeneous populations in SPDs research, there have been increasing numbers of studies that have focused on children with particular diagnoses or specific types of SPDs, such as sensory defensiveness and SMDs.

The second study into prevalence in a non-referred population was published by Ben-Sasson et al. (2009). These authors investigated the incidence of one sub-category of SPDs, Sensory Over-responsivity (SOR). It could be argued that this is a particularly important area to study within education because children who experience SOR often find it very hard to tolerate busy environments such as the classroom or playground. Their difficulties relating to SOR may be demonstrated by poor attention skills, difficulties with learning and disruptive behaviour due to being unable to cope with high levels of sensory input at school (Dunn, 2006). Ben-Sasson et al. (2009) state that SOR may be a risk factor for social and emotional problems. Alternatively children with SOR may also experience social and emotional problems as a separate difficulty.

Participants for the study were initially randomly selected from birth records in Conneticut from 1995 - 1997. Children who had issues (such as low birth weight, premature birth, and birth complications such as hypoxia) were excluded as they were considered to be likely to have developmental delays. A total of 1,329 families took part in one or two annual surveys in early childhood, where the response rate was 89%. A follow up school survey was conducted when children were in second to third grade at school. 17 children were excluded from this later study due to diagnosis of significant genetic disorders or developmental delays. 1,039 families responded to this follow up providing a retention rate of 78%. The Sensory Over-responsivity Survey was added to the school age data and was completed by 925 families (71% of the school aged sample). This inventory includes 76 items, but only the 41 items relating to auditory and tactile modalities were included in this study as difficulties in these areas are most often reported. Scores on the Sensory Over-responsivity Survey were reported to be highly correlated with comparable scores on the SSP (Dunn, 1999). The Child Behaviour Checklist was also conducted which measured internalising, externalising and total problem behaviours.

Ben-Sasson et al. (2009) found that 16.5% (n=148) of the sample was found to have SOR. 76.4% of the SOR group only had elevated tactile scores; 6.8% only had elevated scores for auditory stimuli and 16.9% had both elevated tactile and auditory scores. The total number of children identified as having SOR in this study is higher than those found to have SPDs in Ahn et al.'s study (2004), which is counterintuitive as SOR is a subcategory of SPDs and so one would be expect to see lower prevalence of SOR. In addition, in this study SOR was only measured in the tactile and auditory domain, whereas SPDs includes possible difficulties over 8 domains.

As different assessments were used in these studies it is likely that different cut off points have contributed to different rates of prevalence being reported. In the Ben-Sasson et al. study, children were counted as having SOR if they were rated as being 'bothered' by 4 or more sensations. It is not clear whether being 'bothered' by a sensation is serious enough to interfere with a child's functional ability on a daily basis. As noted by Miller et al. (2007) a diagnosis of Sensory Processing Disorder should only be made '…*if, and only if, the sensory processing difficulties impair daily routines or roles'* Miller et al. (2007, p 136).

It is noteworthy that such a high rate of SOR was found despite children with birth difficulties being excluded, as antenatal problems and difficulties during delivery have been associated with SPDs as discussed above. Children with genetic syndromes and developmental delay were also excluded before the school aged survey, which again makes the high level of reported SOR surprising as SPDs are associated with learning disabilities.

Hence, Ahn et al. (2004) and Ben-Sasson et al. found a prevalence of between 5 and16% in their samples of children taken from the general population. Tomchek & Dunn, 2007 found an even lower incidence of 3.2% in a control group of children who had been screened to exclude those who were taking regular medication of receiving special education services.

2.6 Links between SPDs and BESD

A number of studies have commented on links between SPDs and behaviour difficulties. Ben-Sasson et al. (2009) found that children with SOR were four times as likely to have internalising behaviour scores that were of clinical concern and three times more likely to have externalising behaviour scores that were worrying. The authors summarise the relationship between SOR and social-emotional development as follows:

'*SOR may play a role in the emergence of social-emotional problems by causing an individual to withdraw, and / or avoid negatively perceived sensations and become anxious in anticipation of the stressful sensory experience…Alternatively, social-emotional problems may complicate a child's ability to cope with over-stimulation, and / or may lead parents to notice a child's over-response*' (2009, p 713).

Although SOR is only one sub-category of SPDs, it is perhaps particularly relevant to education and children who have been identified as having behavioural problems in school. This is because children who are overwhelmed with sensory overload may respond with defiance, withdrawal or attempt to be controlling in order to manage their sensory overload (Dunn, 1999), all of which are noticeable and problematic behaviours in a school setting.

In a study of sensory defensiveness and twins, Goldsmith et al. (2006) found that anxiety and fearful temperament were moderately associated ($p = .01$) with tactile and auditory defensiveness. Goldsmith et al. noted that '*anxiety appears to be a core feature of the disorders that co-occur with sensory defensiveness'* (p 394). Similarly Rogers et al. (2003) found a significant relationship between abnormal sensory reactivity and overall difficulties in adaptive behaviour when studying toddlers with ASD. Likewise, Hilton, Graver & LaVesser (2007) found significant associations between difficulties in social responsiveness and SPDs for 36 children with high functioning autism.

As has already been noted in section 2.4.2, Franklin et al. (2008) found a correlation between children with SPDs and observed behaviour difficulties ($p < .05$), with 84% of children being rated as having both SPDs and behaviour difficulties. They stated '*These findings suggest that deficits in sensory modulation and auditory processing may result in an increased prevalence of behavioural impairments because of poor adaptive behavioural responses*' (2008, p 271).

Some research has been undertaken into adult responses. For example, Kinnealey & Fuiek (2006) found significant differences for anxiety and depression in sensory defensive adults compared to typical adults (n=32). In addition, adolescents with Developmental Co-ordination Disorder have been found to have lower self esteem and more anxiety than peers (Barnhart, Davenport, Epps & Nordquist, 2003). Developmental Co-ordination Disorder is thought to be closely linked to sensory based motor disorders (Miller et al., 2007). The study examined 55 individuals; those with Developmental Co-ordination Disorder and both Developmental Co-ordination Disorder and ADHD were found to have more *'criminal offenses, more incidences of substance abuse and other psychiatric disorders, and lower levels of schooling'* (Barnhart et al. 2003, p 725) compared to typical participants.

A number of studies discussed above have investigated SPDs in groups of children with other diagnoses (e.g. ASD or ADHD) who commonly experience behaviour difficulties at school. The evidence indicates that while a high percentage of pupils with SPDs are observed to have behavioural, emotional and social difficulties (Ben-Sasson et al., 2009; Goldsmith et al., 2006; Hilton et al., 2007; and Franklin et al., 2008), not all children with diagnoses associated with BESD have SPDs. As discussed in section 2.4.3, Parush et al. (2007) and Mangeot et al. (2001) identified two distinct groups when investigating children with an ADHD diagnosis; those with SPDs and those without. Both Parush et al. (2007) and Mangeot et al. (2001) found considerable variability in the sensory processing of children with ADHD, leading them to hypothesise that within the ADHD population two distinct subgroups exist, those with SMD and those without '*This suggests that a group of children with ADHD may have normal physiological reactions and behavioural responses to sensory stimuli, whereas another group may be hyperreactive and overresponsive*' (Mangeot et al., 2001, p 404).

Hence, while it is suggested that children with SPDs are often also observed to have BESDs, it does not follow that all children with BESD have SPDs. This demonstrates that although some of the behaviours observed in children with SPDs are also common in BESD children, SPDs are a distinct entity which can be distinguished from general behaviour difficulties (Parush et al., 2007). No research has been found that examines the prevalence of SPDs among children who have been identified by teachers as having difficulties in school. Hence, there is currently no evidence to show the prevalence of SPDs among pupils struggling with BESD at school.

2.7 Environmental Issues that may Relate to SPDs and BESD

There is a very wide range of possible environmental influences that may affect children's behaviour and sensory responses. Some issues associated with current lifestyles are considered below.

2.7.1 Influence of Electronic Pastimes

It is common for the British press to comment that influences such as computer games and television are detrimental to children's development. However, the research evidence is more complex than the press often implies. For example, research conducted by Pagani, Fitzpatrick, Barnett & Dunbow (2010) in Canada, found that pre-school children who watched high levels of television showed poorer attention, academic achievement, took less exercise and ate more snacks than other children. Pagani et al. (2010) argue that television watching displaced other play-based activities and hence reduced children's opportunities to learn through play. Similar results were found by Christakis, Zimmerman, DiGiuseppe & McCarty (2004) who found a decrease in attention spans at seven years old for children who had been exposed to high levels of television at preschool. However, Wright et al. (2001) point out that the impact of television on children depends on more than just the total numbers of hours watched. In fact, the content of the programmes is critical. Some programmes designed for young children were found to be beneficial, whereas it is proposed that exposure to adult programmes is detrimental because the content provides little engagement for the child but takes the adult's attention away from interacting with the child.

Research into children's use of computer games also presents a complex picture. Considerable research has focused on the effects of violent video games on children and adolescents. Some authors such as Swing & Anderson (2007) have concluded through meta-analysis that use of violent video games leads to increased aggression even after a short exposure to the games. However, Ferguson (2007) argues that there is a publication bias towards publishing research that suggests links between violent computer games and aggressive behaviour. When the publication bias is corrected he states that there is no evidence to support the hypothesis that violent computer games cause increased aggression. However, he did find evidence for positive effects on children's visuo-spatial skills. Likewise Griffiths suggests that online gaming can have a number of positive effects in that the activity raises self-esteem, makes people feel psychologically better and allows young people to experiment with risk in imaginary scenarios without the dangers of other potentially addictive pastimes such as alcohol and drugs (2010). However, Griffiths acknowledges that excessive gaming displaces other play activities and he advises *'Parents to set time limits on their children's playing time'* (p38). Therefore, while there is some evidence that *excessive* television watching or gaming may negatively impact on children's development, it is perhaps the impact on the quality of interactions between adults and the child and the reduction of other play and learning opportunities that may be detrimental rather than the viewing itself. It could be argued that excessive exposure to television may impact on a child's sensory opportunities because it is a sedentary activity and television may be very distracting if it is a regular background noise, as discussed below.

2.7.2 Levels of Physical Activity Among Children

McLaren, Edwards, Ruddick, Zabjek & McKever (2011) highlight the importance of movement and gesture for optimal cognitive and communicative development. McLaren et al. state that research suggests,

> '*that there is a synergy between cognitive knowledge and bodily knowledge and that children learn through movement rather than by relying solely on their verbalisation or recollection skills*' (2011, p100-1).

Similar conclusions have been drawn by Raine, Reynolds, Venables & Mednick (2002), who found in a longitudinal study that active children who sought out a high level of stimulation at 3 years old showed increased academic, cognitive and neuropsychological test performance at age 11. Hence these studies, which suggest the benefits of movement on children's development, highlight the importance of movement activities in the classroom and indicate that excessive sedentary activities, whether it be watching television or during long periods sitting still in class, may be detrimental due to restricting movement opportunities.

There is evidence to show that school children are not physically active enough. For example Cardon & De Bourdeaudhuij (2008) investigated the physical activity of 4-5 year olds (n=76) on both school days and at the weekend. It was found that the children were on average sedentary for 9.6 hours (or 85%) of the day and that the mean amount of moderate to vigorous physical activity was 34 minutes (5% of the day). Only 7% of the sample engaged in the recommended level of moderate to vigorous physical activity which is 60 minutes per day in the UK and USA (Cardon & De Bourdeaudhuij, 2008). No significant difference was found between activity levels on school days and at the weekend. This indicates that the children in this sample spent on average 85% of their time engaging in sedentary activities, which may be limiting their breadth of sensory experiences and their opportunities to learn through movement. Tucker (2008) conducted an overview of 39 studies (representing a total of 10,316 children) that examined the activity levels of 3-6 year old children. She found that only 54% of the participants took the recommended guideline of 60 minutes of physical activity per day. Tucker also reported that boys engaged in more physical activity than girls.

Metcalf, Voss, Hosking, Jeffery & Wilkin (2008) also investigate activity levels for boys compared with girls. They measured physical activity in 113 boys and 99 girls in the UK and found that only 42% of the boys and 11% of the girls were taking the recommended amounts of physical activity. Metcalf et al. noted that girls are habitually less active than boys and suggested that either there needs to be a concerted effort to increase girls' levels of activity or perhaps there should be different guidelines for boys and girls to reflect the fact that boys are generally more active. Similar conclusions were drawn by Nettlefold, McKay, Warburton, McGuire, Bredin & Naylor (2011) in a Canadian study, where girls were found to take less moderate to vigorous physical activity than boys throughout the school day. For example during recess only 15.7% of girls and 34.1% of boys achieved recommended amounts of physical activity. Worryingly, during PE lessons only 1.8% or girls and 2.9% of boys were found to achieve recommended levels of physical activity. Nettlefold et al. (2011) concluded that schools should compliment PE with other opportunities for physical activity during the school day. The fact that boys have been found to be more active than girls is relevant to gender issues raised in the discussion section of this paper.

Rothon, Edwards, Kamaldeep, Viner, Taylor & Stansfeld (2010) highlight the association between exercise and depressive symptoms in a longitudinal study of 2,093 school children in East London. It was found that most pupils took between 0.5 – 2-3 hours of physical activity a week, which is well below the UK guidelines of 1 hour of physical activity a day. There was a strong association between physical activity and depressive symptoms ($p = 0.003$). The likelihood of depressive symptoms decreased by 11% for every additional hour of physical activity undertaken each week. Nearly a quarter of the sample was rated as being depressed and girls were nearly twice as likely to show depressive symptoms compared with boys. Similar links between physical activity, academic success and mental health were found by Kantomma, Tammelin, Demakakos, Ebeling & Taanila (2009). Trudeau & Shepherd (2008) conducted a review of research into physical activity, academic performance and behaviour in schools. They concluded that increased levels of physical activity were positively associated with academic outcomes and improved classroom behaviour.

Reduced levels of physical activity among school children may be in part due to young people's interest in sedentary activities such as electronic entertainment. However many other factors are also likely to be involved. For example, Fuemmeler, Anderson, & Mâsse (2011) found links between parental and child activity levels showing the influence of adult behaviour on children's exercise habits. Like Metcalf et al. (2008), Lopes, Rodrigues, Maia & Malina (2011) found in a longitudinal study that boys engage in higher levels of physical activity than girls. In addition Lopes et al. found that motor coordination was a predictor of activity levels and children with good motor coordination took more exercise. For children with low or average motor-coordination their levels of physical activity was found to decline as the children matured from 6 – 10 years old. These findings are relevant to the theory of sensory processing, which suggests that children learn to integrate their senses through a wide range of sensory experiences (Dunn, 1999). Unfortunately Lopes et al.'s findings suggest that children with motor coordination difficulties may reduce their sensory opportunities by engaging in less physical activity than their peers.

2.7.3 Family Influences

Meltzer, Gatward, Goodman & Ford (2000) provide a wealth of information about factors that influence the incidence of mental health issues in children in their survey of 10.438 families in the UK. Meltzer et al. (2000) found that the incidence of mental disorders was greater among children who lived: in single parent (16%) compared with two parent families (8%); in reconstituted families (15%) rather than those with no step-children (9%); in families with five or more children (18%) compared with two-children (8%); if the interviewed parent had no educational qualifications (15%) compared with a degree level or equivalent qualification (6%); in families with neither parent working (20%) compared with both parents at work (8%); in low income families (16%) compared with families with weekly incomes of £500 or more (6%); whose parents are social sector tenants (17%) compared with owner occupiers (6%). This clearly indicates that the incidence of mental difficulties such a conduct disorders, hyperactivity, anxiety and depression is affected by a range of environmental issues in the child's life. It is possible that the way in which children process sensory information may also be affected by these factors, but to date no surveys of this magnitude have investigated sensory issues.

2.7.4 School Environment

Another factor that may be affecting children's levels of physical activities is the risk adverse culture which is currently prevalent in the UK as noted by Bundy, Luckett, Tranter, Naughton, Wyver, Ragen & Spies (2009). Bundy et al. proposed that teachers have become risk adverse in a culture of health and safety regulations and litigation. So, as a result children's playgrounds lack challenging opportunities. Bundy et al. found that children's activity levels increased when items such as tyres and large boxes were made available in the playground. Although teachers perceived that the risk of injury had increased (despite no injuries occurring) during the 11 week study, they also rated that the children had become more creative, social and resilient.

Jull (2008) comments that '*school environments can indeed incite disruptive behaviour as a function of a mismatch in student needs and educational provision'* (p 15). Jull lists a number of environmental factors that may impact on children's behaviour such as inappropriate academic requirements, autocratic or permissive teaching style and over-stimulation or under-stimulation. The impact of environmental factors on children's academic success is also raised by LaRocque

(2008) who concludes that '*learning environments strongly influence student outcomes and play an important role in improving the effectiveness of learning'* (p301). Likewise Rush & Harrison (2008) state,

> '*The classroom environment can make an enormous difference with regard to the academic and personal outcomes of adolescents, particularly those with ADHD… the most important determinants of adolescent mood and behaviour seem to be environmental and contextual factors'* (p 208).

This highlights the way in which a child's behaviour (and this may include sensory behaviour) is the product of the interaction between the child and his/her environment and hence supports the shift in thinking among educational professionals away from a 'within child' view of BESD (Jones, 2003).

2.7.5 Noise Levels

Flagg-Williams, Rubin & Aquino-Russell (2011) discuss classroom soundscape, another environmental consideration which affects children at school. Flagg-Williams et al. state,

> *'In order to be successful learners, students need to focus on important sounds, such as speech, whilst not attending to background noise. The classroom soundscape affects the effort students must use in order to receive and understand all of the audible messages that are relevant to their learning (p89).*

Flagg-Williams et al. state that typical classrooms in the UK do not meet recommended guidelines for levels of reverberation and background noise, meaning that children have to apply considerable effort to accurately hear verbal messages which leaves less mental capacity for processing the meaning of the information. Flagg-Williams et al. (2011) suggest that children are particularly vulnerable to comprehension difficulties in noisy environments compared with adults, due to their immature language systems being less able to 'fill in the gaps'. They go on to state that children with deficits in learning, attention, speech language or auditory processing are likely to find learning in noisy environments particularly challenging. These comments about the implications of background noise may suggest some links to research relating to excessive exposure to television (for example Wright et al., 2001) and to observations relating to concerns about some children having difficulties with auditory processing (e.g. Dunn, 2006; Heller, 2003). Flagg-Williams et al. (2011) comment that noise involving spoken language tends to be the most distracting, which suggests that children who routinely have to attend against the noise of a television, radio or perhaps chatter in class may find it difficult to attend to learning tasks. Gathercole & Alloway (2009) also comment that background verbal noise is particularly disruptive to working memory skills. Flagg-Williams et al., suggest that children who are regularly exposed to noisy environments may develop auditory issues as they loose the habit of listening.

2.8 An Overview of Behavioural Emotional and Social Difficulties in the UK

In order to be included in this study all participants had to be identified as having behavioural, emotional or social difficulties on a teacher rating questionnaire. Therefore it is important to provide an overview of the issues currently surrounding BESD in schools, so that environmental factors can be considered alongside SPDs during the discussion of the results. The term behavioural, emotional and social difficulties covers a very wide range of potential issues and behaviours and an equal variety of possible causes for the difficulties. It is common for adults to complain about youth behaviour and there is currently widespread concern about poor behaviour standards in schools (Steer, 2009). In a survey of 10,438 families, Meltzer, Gatward, Goodman & Ford (2000) provide an indication of the prevalence of mental disorders among children in the UK. Meltzer et al. found that 10% of children had a mental disorder; 5% were found to have a significant conduct disorder; 4% were assessed as having emotional disorders and only 1% of the sample was rated as being hyperactive. Meltzer et al. (2000) also found gender differences for mental health difficulties. For example girls were found to have a slightly higher incidence of emotional difficulties compared with boys (4.5% compared with 4.1%) whereas the incidence of conduct disorders (7.4% compared with 3.2%) and hyperkinetic disorders (2.5% compared with 0.4%) was higher for boys.

There is some evidence that behavioural and emotional difficulties are on the increase. Green, McGinnity, Meltzer, Ford & Goodman (2005) report that the percentage of 15/16 year olds found to experience emotional and behavioural problems has shown a steady increase from 1974 to 1999 and then remained at a high level. For example, over 20% of girls were rated as having emotional difficulties in 1999 compared to 12.5% in 1974. In addition Beaman, Wheldall & Kemp (2007) in a review of 14 studies into troublesome classroom behaviour concluded

> '*Prevalence rates for disruptive behaviour may vary, but what is apparent from the research presented in this review is more evidence of a rising percentage of behavioural difficulties in classrooms as students move from the early years to adolescence. This suggests a pattern of increasing disruption as students move into the secondary school system'* p 51.

However more recently, Sir Alan Steer in his report '*Learning Behaviour: Lessons Learned. A review of behaviour standards and practices in our schools*,' (2009), states that poor behaviour in school is at the lowest level ever recorded. Ofsted reported that only 1% of primary and 2% of secondary schools were found to have inadequate behaviour on inspection in 2008 (Steer, 2009).

This finding was supported by a large scale observational study of primary classrooms involving observations in 141 UK primary classrooms conducted by Apter, Arnold & Swinson (2010). They concluded that '*Students in UK Primary classrooms were observed to be more 'on task' and thus, in popular parlance, 'better behaved' than they have been previously during the last 20 years, and probably longer'* (p 170). The study recorded that children were on task 85% of the time. Apter et al. (2010) state that surveys have shown a steady trend towards higher rates of 'on task' behaviour since Wheldall & Merrett's data from 1987 where 69.7% of children were found to be 'on task' (1988).

As stated by Steer (2009), current evidence shows that the behaviour of most children in school is generally good. Steer refers to two surveys conducted in 2008, (by the National Union of Teachers and the National Association of Schoolmasters/Union of Women Teachers). The results of both surveys suggest that teachers believe that the severity of the behaviour of a minority of pupils is increasing (Steer, 2009). However, Steer's report concludes that the most common troublesome behaviours were low level disruptions such as talking out of turn. Steer goes on to note that there is a gap between the widespread perception of poor behaviour within UK schools and survey results that indicate that school behaviour is currently good. He suggests that this may be due to overly negative press coverage of young people and schools (Steer, 2009).

So, despite some evidence of an increase in mental disorders among children (Green et al., 2005) there is little evidence to support the common perception that behaviour in schools has significantly deteriorated in recent years (Steer 2009). Studies have shown that teachers perceive frequent disruptions as being the most troublesome in class, even if the behaviour is relatively trivial (Beaman et al., 2007). Research conducted by Wheldall & Merrett in the UK (1988) found that teachers perceived '*talking out of turn*' and '*hindering other children*' as the most frequent and troublesome behaviours in primary schools. Similar research conducted by McDonald & Wilks 1994, (cited in Little, 2005, p 370) in Australia, found that being '*easily distracted*' and '*not listening to directions*' were two of the behaviour problems most reported by teachers. Ho & Leung (2002) found similar results: the top three troublesome behaviours (out of 15 behaviour categories) were rated as '*talking out of turn*', '*non-attentiveness*' and '*forgetfulness*'. Beaman et al. (2007) conducted a review of recent research into teachers' perceptions of troublesome behaviour. Several of the studies reviewed took place in Australia with others in the USA, Greece, Hong Kong, Jordan and Malta. The review supported the findings listed above. Although cultural differences must be acknowledged, Beaman et al.'s review indicates that Wheldall and Merrett's (1988) research findings in the UK have been supported by a number of other international studies.

Several studies have reported that teachers feel they spend too much time dealing with classroom behaviour issues (e.g. Wheldall & Merrett, 1988) which would indicate that strategies to reduce low level classroom disruptions would be valuable. As stated by Little (2005):

> *'Given that teachers perceive that they are spending too much time on issues of order and control, and that these behaviours are minor in nature, it is clear that interventions that deal specifically with these behaviours are needed'* (p 370).

A teacher's perception that a child has BESD may lead to negative outcomes for the child. As noted by Kokkinos, Panayiotou & Davazoglou (2004) '…*undesirable pupil behaviours are more likely to evoke unfavourable impressions of the pupil, and yield negative attitudes on the teachers' part'* (p 110). Negative teacher attitudes may have a significant impact on learning because, as noted by Willingham (2009), one of the key factors which enable children to learn is a good emotional bond between the teacher and the pupil. Evidence indicates that when teachers display positive emotional support, pupils report that their behaviour improves: '…*as teachers' display of emotional support toward students increased, students reported that they engaged in less off-task behaviour and less teacher-directed antagonistic behaviour*.' (Geving, 2008, p 627). Hence, it can be seen that low level disruptive behaviours remain a concern to teachers. Behaviours may include non-attentiveness, easily distracted, not listening to direction etc. all of which are behaviours that may be commonly seen in children with sensory difficulties.

BESD may take many forms, from low level disruptive behaviour such as talking out of turn, to infrequent but serious incidents such as verbal abuse within the classroom. Little (2005) found that verbal abuse was rated by teachers as accounting for 10% of the most disruptive behaviour in secondary classes. Whereas only 2% of teachers rated 'Aggression' as being the most troublesome classroom behaviour (Little 2005) which supports the evidence that externalising behaviours such as aggression are infrequent (Kokkinos et al., 2004; Beaman et al., 2007). The causes of such a range of behaviours are numerous. Some children may display BESD due to academic failures at school. Willingham (2009) proposes that humans are naturally curious and like to learn, but that thinking is effortful and requires concentration. Pleasure in learning is derived when moderately challenging problems are successfully solved. So it is unsurprising that pupils who repeatedly experience task failure soon become unmotivated and hence disruptive (Willingham, 2009).

The importance of effective strategies to manage pupil misbehaviour is highlighted by research into the causes of teacher stress which is reported to be prevalent (Geving, 2007). Pupil misbehaviour has been repeatedly identified as a cause for teacher stress with '*student apathy'* or '*lack of effort'* being strongly associated with teacher stress. It could be argued that teachers experiencing high levels of stress will be less tolerant of disruptive classroom behaviour and less able to think of creative ways in which to support pupils with inattentive behaviour in class. Less experienced teachers appear to be more susceptible to stress caused by poor pupil behaviour (Kokkinos et al., 2004) which highlights the need for behaviour management techniques and underlying causes of poor pupil behaviour to be emphasised on teacher training courses.

Some professionals have highlighted the importance of social competence when considering children's challenging behaviour in school. For example, in a study of teachers' perceptions of emotional & behavioural difficulties Poulou (2005) concludes that teachers observed that children who are socially competent are

> '*less engaged in problem behaviour, are better at making friends, have more effective ways of dealing with authority, and are more able in conflict resolution and at problem solving than their more disruptive peers.*' p49

Likewise Hartnell (2010) stresses the importance of social skills in preventing permanent exclusions, as it was found that one of the factors that reduced permanent exclusion was the offer a flexible and differentiated curriculum with an emphasis on personal and social development.

The recent shift to include children with a diverse range of special educational needs in mainstream schools has created additional challenges for teachers. It is now expected that children with a range of physical, cognitive, sensory and behavioural needs will be managed within mainstream classrooms. In order for this to be successful, teachers are required to provide highly differentiated work to suit children with a wide range of abilities (Beaman et al., 2007). Additional equipment and support staff may also be present within classrooms and need to be effectively managed. Although the policy of inclusion is laudable, it is suggested that an unintended outcome has been an increase in distractions and challenges within mainstream classrooms (Beaman et al, 2007). This may impact on teacher stress levels and on the number of children in mainstream classrooms who have some level of behaviour, emotional or social difficulty. As stated by Beaman et al. (2007):

> *'…the inclusion of students with disabilities within regular classrooms requires teachers to have high-level classroom management skills, as well as the necessary skills to program effectively for all students in the class. Teachers engaged in such a complex instructional mission need highly effective behaviour management techniques in order to meet with needs of all the students in their classrooms'* (p 45).

2.8.1 BESD and Links to Low Socioeconomic Status

Washbrook & Waldfogel (2011) reported on data collected for the Millennium Cohort Study, a nationally representative UK sample of around 15,000 children who were aged five in 2006. The data showed that children from the families with the lowest incomes were on average 14 months behind their more affluent peers on a measure of vocabulary and also had significantly more behavioural difficulties at the age of 5 years old. While genetic causes for this difference have to be considered, the report concludes that environmental factors have huge impact on children's social and emotional development:

> '*Aspects of children's environment such as their exposure to learning opportunities, parents' approach to parenting and mothers' psychosocial and physical well-being all have a strong influence on the cognitive and socio-emotional development of children. Where parents are squeezed for resources of both time and money there is a risk that the resulting stress translates into less conscientious or sensitive parenting'* (Washbrook & Waldfogel, 2011, p 15).

Such research supports evidence that environmental factors may have a significant impact on the BESD that teachers observe in schools. Links between low socioeconomic status and mental health disorders in children were also found by Meltzer et al. (2000) as discussed in section 2.7.3.

In 2007 the UNICEF report 'Child poverty in perspective: An overview of child well-being in rich countries' presented sobering results showing that on six measures of child wellbeing the UK scored in the bottom third of 21 countries for five out of the six measures. In fact the UK scored below all other countries for 'Family and Peer Relations', 'Behaviour and Risks' and 'Subjective Wellbeing' (UNICEF, 2007). Layard and Dunn (2009) speculate that these poor outcomes for children in the UK have a risen due to factors such as excessive individualisation, family breakdown, greater income inequality and relative poverty.

Griggs & Walker (2008) comment on the links between child poverty and BESD, in a review of evidence of the impact of child poverty in industrial countries. They state:

> '*An association between childhood poverty and behavioural outcomes is evident from an early age. Those growing up in low-income households have a greater likelihood of parent reported behaviour problems than their more affluent counterparts. They are also more likely to be excluded from school. Later outcomes include risk-taking behaviour, aggression, involvement in crime, poor health-related behaviours and suicide'* (p 5).

Griggs & Walker (2008) also found links between child poverty and social and emotional development. They explain that it has been found that low-income families have fewer opportunities to develop relationships due to a lack of accessible and safe places to meet. In addition lack of finances is often a limiting factor on socialising. This conclusion is supported by Goodman & Gregg (2010) who reviewed data from four large scale longitudinal studies. They concluded that evidence clearly showed that children from poorer backgrounds achieved lower educational attainments. In addition '*children from poor families typically display many more behavioural problems, at all ages, than children from better-off backgrounds*' (Goodman & Gregg, 2010, p 51).

Similar results have been found in other industrialised countries. Ross & Roberts (1999) examined parental ratings for a number of factors compared to the family income in Canada. It was found that where the family income was less than $20,000 children were rated as having higher rates of difficulties compared to wealthier peers in many different areas including the following: indirect aggression; emotional difficulties; hyperactivity and inattention; delinquent behaviour; delayed vocabulary; and they were more likely to not be in training education or employment as a teenager.

Pickett and Wilkinson (2007) found similar results in an international cross sectional study of child wellbeing. It was found that child wellbeing was significantly worse in countries with a high level of relative child poverty. So, although a country as a whole might be wealthy, there were high rates of concern about child wellbeing for countries with a high level of wealth inequality. Although these data do not specifically comment on BESD in schools it does clearly show links between relative poverty and poor outcomes for children.

Low socioeconomic status is also associated with higher levels of abuse (Cawson, Walton, Brooker & Kelly, 2000). The NSPCC conducted a survey of 2,869 young people. Cawson et al. report that 6% of the sample experienced serious lack of care, 7% were seriously abused through parental violence and 6% rated themselves as having been seriously sexually abused (2000). These data indicate that many schools are likely to contain children who have experienced some level of abuse. Such trauma may cause some children to display BESD. Dyregrov (2004) states that the effects of trauma and loss may persist for months or even years after a tragic event, by which time school staff may expect children to have come to terms with the tragedy. Or course, in many cases of abuse, school staff may be completely unaware of the difficulties that the child has experienced.

It is suggested that environmental factors such as socioeconomic status and childhood trauma greatly affect child development and may impact on how the child processes sensory information as well as on his/her behavioural, emotional and social development (Ben-Sasson et al., 2009). Therefore, it is important to consider the environmental issues in children's lives when trying to support their needs.

2.9 Conclusions drawn from the Literature Review

The review of literature surrounding sensory processing difficulties indicates that there is continued debate about the use of the term sensory processing disorder as an independent diagnosis and the resolution of this issue is beyond the scope of this study. However, there is evidence that indicates that certain children experience difficulties with sensory processing compared with typical children (Parush et al., 2007; McIntosh et al., 1999; Davies & Gavin, 2007; Tomchek & Dunn, 2007; Baranek, 2002; Ermer & Dunn, 1998; Dawson & Watling, 2000; Watling, Deitz & White, 2001; Franklin et al., 2008; Mangeot et al. 2001; Rogers et al., 2003; Ahn et al., 2004; and Ben-Sasson et al., 2009)

A number of studies have found links between SPDs and behavioural difficulties (Ben-Sasson et al., 2009; Roger et al., 2003; and Franklin et al., 2008). However, no study to date has attempted to establish the prevalence of SPDs in a sample of children identified by teachers as having BESD, which is the main purpose of this research. The majority of studies into the prevalence of SPDs have used the SSP as their sole measure of sensory processing for example: Mangeot et al. (2001); Baranek et al. (2002); Baranek (2002); Rogers et al. (2003); Tomcheck & Dunn (2007); Franklin et al. (2008); and Gavin et al. (2011). Using the SSP alone provides no data about children's sensory behaviour in school or about whether individual children are observed to have sensory difficulties both at home and school. Hence, it was ascertained that there is a need to investigate comparisons between parental and teacher ratings of children's sensory behaviour. Collecting sensory data from two sources could also result in a more robust measure of SPDs.

The literature review has revealed that SPDs are associated with a number of other factors such as difficulties at birth (May-Benson et al., 2009), attachment difficulties (Naber et al., 2008), ASD (Tomchek & Dunn, 2007) and ADHD (Mangeot et al., 2001). Many of these factors are also associated with BESD. Hence, it was decided to investigate whether the same associations were evident in this study.

No attempt is made in this study to formally diagnose sensory processing disorder, due to the issues that surround the use of the term as a discrete diagnosis and the specialist training, time and expertise that would be required to make a formal diagnosis of such a disorder. Also the term sensory processing disorder carries an implication of a within child deficit, whereas the literature review has highlighted a number of environmental factors that may influence sensory processing. Hence, two screening questionnaires are used to provide an indication of whether children had difficulties with the way in which they process sensory information compared with typical children. The limitations presented by the use of screening questionnaires to identify sensory difficulties are discussed in section 3.1.3.c and 5.10.3.

The research summarised in the Steer Report (2009) indicates that the overall level of BESD may be at an all time low. However, surveys indicate that teachers still have concerns about the behaviour, emotional and social difficulties of a number of children in their schools (Steer, 2009) and there is some evidence of a rising percentage of BESD as children progress towards secondary school (Beaman et al., 2007) . Understanding the sensory needs of these children may help to alter adults' perceptions of challenging individuals and enhance the methods used by teachers and psychologists to support children with BESD. No prior research has indicated the level of teachers' understanding of SPDs. Therefore, it may be beneficial to collect data to show the current level of understanding about SPDs in a sample of British primary schools.

The review of the literature surrounding SPDs has lead to the conclusion that the following research questions are likely to illuminate the nature and prevalence of SPDs and the relationship between SPDs and BESD.

Question 1: What is the prevalence of sensory processing difficulties (SPDs) in children who have been identified as having behavioural, emotional or social difficulties (BESD) at school?

Question 2: Is there an association between the sensory scores provided by parents and those provided by teachers?

Question 3: Do the data collected in this research indicate an association between SPDs and other factors? For example:

- attachment difficulties / anxiety;
- premature delivery / birth trauma;
- learning difficulties / other conditions that affect development.

Question 4: What is the current level of knowledge of Special Needs Co-ordinators (SENCos) about SPDs in schools?

Chapter 3

Research Design & Methodology

The main aim of this research is to provide an indication of the prevalence of SPDs for children who are identified as having behavioural, emotional or social difficulties (BESD) at school. Hence, it was necessary for schools to identify children who had BESD and then for a measure of sensory processing to be collected for each child. A major criticism of previous research into SPDs has been the very small number of participants in many studies. In order to avoid this pitfall, a methodology had to be chosen that would provide data on at least 100 participants and yet remain within the financial and time limitations of the study. The use of questionnaires was decided to be the most cost effective and time efficient method for acquiring BESD and sensory data on a large number of children. Research Questions 1, 2 and 3 all refer to the main study (Study A) which involved collecting sensory data for pupils with BESD. Research Question 4 is answered through a separate line of investigation (Study B) and required a brief questionnaire to be sent to all SENCos across one local authority in the UK. A timetable of the research is included at the end of this chapter.

It was decided that the measures described in Table 1 below would be used. Copies of the Short Sensory Profile and Sensory Profile School Companion are available from Pearson Assessments because it has not been possible for them to be reproduced due to copyright. Copies of the other measures used are provided in Appendix 1.

Table 1:

Measures Used in the study

Questionnaire completed by:	Questionnaire Used & Number of Questions		How the measure contributes to answering the research questions.
Study A			
Parent	Parental Background	11	Allows investigation of the association between sensory difficulties and other background factors (Q3).
Parent	Short Sensory Profile (SSP)	38	Provides a parental measure of the child's sensory processing difficulties (Q 1, 2 & 3).
Teacher	Teacher Background	10	Allows investigation of the association between sensory difficulties and other background factors (Q3).
Teacher	Strengths and Difficulties Questionnaire (SDQ)	25	Provides a measure of the child's BESD. Children must have difficulties in at least 1 of the 5 Sections on the SDQ to be included in the study.
Teacher	Sensory Profile School Companion (SC)	62	Provides a teacher measure of the child's sensory processing difficulties (Q 1, 2 & 3).
Study B			
SENCos	Questionnaire for SENCos	9	Provides information about the current level of knowledge that SENCos have about SPDs (Q4).

A number of previous studies have only used the SSP as the measure of SPDs (e.g. Ahn et al., 2004; Baranek, 2002; Baranek et al., 2002; Franklin et al., 2008; Gavin et al. 2011; Mangeot et al. 2001; Rogers et al. 2003; and Tomchek & Dunn, 2007). In this study, sensory processing data were collected from both parents and teachers. This is for two reasons. Firstly, it meant that more detailed sensory data could be collected because in addition to the 38-question Short Sensory Profile completed by parents, teachers also answered 62 questions on the child's sensory processing at school. Secondly, collection of sensory data from both parents and teachers enables investigation into whether children are reported to have the same sensory difficulties both at home and at school (Research Question 2). If SPDs are observed for a child in both settings it provides more robust evidence of the child's sensory needs than a brief parental report does in isolation. Where reports of a child's sensory behaviours differ between home and school, questions need to be asked about whether parents' and teachers' constructions of sensory behaviours differ, or perhaps whether the Sensory Profile Questionnaires provide an effective measurement of SPDs.

3.1 Measures Used for Study A

3.1.1 Background Information Sheets

Parental and Teacher Background Information Sheets were designed (see Appendices 1a & 1b). The data provided on the background information sheets enabled the links between SPDs and other factors to be examined (Research Question 3). For example, whether the child has other diagnoses, was born prematurely or has academic difficulties at school. Questions were chosen for inclusion on the Background Information Sheets due to the results of previous research suggesting links between SPDs and particular factors. The intention was to investigate whether the link was also evident in this research sample. For example, research has provided evidence of associations between SPDs and Autistic Spectrum Disorders (e.g. Tomchek & Dunn, 2007 and Ermer & Dunn 1998) and between SPDs and complications during the baby's delivery (May-Benson et al., 2009) etc. Justification for why each question has been included is provided on the reverse side of the Background Information Sheets so that participants were clear about why the information was needed.

The Background Information Sheets were piloted with five parents of school-aged children and five primary school teachers. No issues were raised during the pilot so no alterations were made.

3.1.2 The Strengths and Difficulties Questionnaire (SDQ)

A measure of each child's BESD was sought from the school to ensure that only children with BESD were included in the study. The Strengths and Difficulties Questionnaire (SDQ) was chosen for this purpose. Any children who were rated as not having BESD were excluded from the study.

The SDQ is a brief behavioural screening questionnaire for 4-16 year olds. In 1999 the SDQ was used in a large national survey of child and adolescent mental health carried out by The Office for National Statistics and funded by the Department of Health. This representative British sample included 10,438 individuals aged between 5 and 15 years old (Meltzer, Gatward, Goodman & Ford, 2000). The SDQ is widely used. Currently it is available in 75 different languages and can be downloaded free of charge from the internet.

The psychometric properties of the SDQ were evaluated by Goodman (2001) who concluded that the SDQ's reliability and validity meant that it was a helpful brief measure of children's behavioural, emotional and social states. Mathai, Anderson & Bourne (2002) assessed the SDQ for the purpose of use as a screening tool for children admitted to the Child and Adolescent Mental Health Service. Mathai et al. concluded that the SDQ was a sensitive and useful screening tool. Goodman et al. (2000) also assessed the SDQ's value as a screening tool for psychiatric disorders. It was found that the SDQ successfully identified over 70% of children with hyperactivity, conduct disorders, depression and some anxiety disorders. However, the SDQ identified less than 50% of children with specific phobias, separation anxiety and eating disorders. Difficulties in identifying specific phobias, separation anxiety and eating disorders are foreseeable because the SDQ is a brief questionnaire and these difficulties are very specific and so are unlikely to be identified by a brief general questionnaire about behavioural emotional and social issues.

Goodman, Ford, Simmons, Gatward & Meltzer (2000) found that SDQs provided by only one respondent were significantly less sensitive than SDQs provided by multi-respondents (e.g. both parents and teachers). This point is noteworthy in relation to the design of this current research because only teachers were asked to complete the SDQ. While it is likely that the SDQ would have provided more sensitive data if both teachers and parents had been asked to complete the questionnaires, parents were not asked to complete an SDQ for two reasons. Firstly, the inclusion criteria for this study involved the children being rated as having BESD in **school**, and parents were not well placed to comment on their child's behaviour while at school because parents rarely actually observe their child in class. Secondly, it was felt that parents would be reluctant to take part if the time required to complete the questionnaires was lengthy. As stated by Robson '*When a self-completion questionnaire is used,* *its complexity has to be kept to a minimum*' (2002, p 238). Hence the research design aimed to minimise the time required for parents to complete the forms.

Goodman and Scott (1999) compared the SDQ to the Child Behavior Checklist and found that scores from the two measures were highly correlated. Both measures were similarly able to discriminate between children who had been drawn from psychiatric clinics opposed to children from a dental clinic. Goodman & Scott concluded that the SDQ was as effective as the Child Behavior Checklist in identifying internalising and externalising difficulties and that the SDQ was significantly better at recognising hyperactivity and attention problems.

Hence, while it is acknowledged that the SDQ is a brief questionnaire it is widely used and research indicates that it is useful as a screening questionnaire for behavioural emotional and social difficulties.

The SDQ provides information about five aspects of a child's behaviour as well as a total score as follows:

Table 2:

Strengths and Difficulties Questionnaire Sections

	Description of the five scales contained in the SDQ	BESD area measured
1	**Emotional Symptoms:** E.g. Is the child clingy, nervous, unhappy, has many worries etc.	Emotional
2	**Conduct Problems:** E.g. Does the child have problems with temper tantrums, fighting, doing what they are told to do etc.	Behavioural
3	**Hyperactivity:** E.g. Is the child over active, restless, easily distracted, impulsive etc.	Behavioural
4	**Peer Problems:** E.g. Does the child have difficulties with friendships, tends to play alone etc.	Social
5	**Pro-Social:** E.g. Is the child considerate, able to share, helpful etc.	Social
6	**Total Difficulties:** The sum of sub scales 1-4	Total BESD Score

Each of the five Sections results in possible scores ranging from 0-10. For Sections 1-4 a high score indicates difficulties and the Total Difficulties Score is the sum of Sections 1-4. Section 5 is scored in the opposite direction, so that a low score indicates difficulties. The Total Difficulties score ranges from 0 – 40. All scores can be categorised into three descriptors, 'Normal', 'Borderline' and 'Abnormal'.

In this research the SDQ provided a standardised measure of the child's behavioural difficulties based on teachers' perceptions. It gave an indication of the areas of need for each child and also the severity of their behaviour in school. This single questionnaire provides measures for all three areas of BESD as shown in the table above. The questionnaire is quick to complete (approximately five minutes), which is essential considering that participation in the research presented an extra burden for busy school staff. In order to be included in the research the child must be rated as having difficulties in at least one of the five areas on the SDQ. It is acknowledged that including participants with only one area of difficulty on the SDQ may not provide a robust measure of BESD. However, it has enabled children with specific difficulties (e.g. social skills, emotional skills or hyperactivity) to be investigated as well as those children with difficulties in a number of areas. Difficulties in only one area (e.g. hyperactivity) may have a major impact on the child's ability to function effectively at school.

The SDQ does present certain drawbacks. For instance, it is a brief questionnaire (25 questions) where teachers are only able to state whether statements are 'Certainly True', 'Somewhat True' or 'Not True'. This results in a fairly crude measure of the child's behaviour. The cut-off scores for the 'Abnormal' category on the SDQ encompass the top 10% of the standardisation sample. This is more liberal than the other standardised measures used in this research and so the SDQ 'Abnormal' category may include more false positives that the other measures. The data provided by the SDQ are only a rating of the teacher's opinion about the child and hence is a subjective measure. The teacher's opinion may be affected by their current relationship with that child. However, the teacher usually knows the child well and so has an overview of the child's behaviour over time and is well placed to consider how the child's behaviour compares to other children of the same age. The SDQ allows individuals' behaviour to be described in a standard way that permits comparison to be drawn between the pattern of concerning behaviour and also the severity of the concern. Due to the numbers of pupils involved in this study it was not practical for the researcher to personally collect behavioural data on all the pupils through observations.

The subjective nature of the questionnaire was evident when viewing responses from schools in different catchment areas. Some schools had very few pupils with BESD and so fairly minor behaviours may be rated as being of significant concern, whereas other schools with a high number of challenging children considered some level of BESD to be typical and hence less noteworthy. Therefore, the results should be considered with caution because behaviour that may be seen as severely disruptive in one setting may not present the same level of concern in another.

3.1.3 Measures of Sensory Processing

Sensory processing difficulties have been measured in a number of ways. Standardised questionnaires exist where adults (who know the child well) provide a rating of a variety of sensory behaviours. The final scores can be compared to expected scores of sensory processing for typical children. The Short Sensory Profile is an example of such a questionnaire and was chosen for use in this study.

SPDs may be recorded by measuring a child's physical response to their environment. However, direct measures of sensory processing deficits (such as electrodermal responses or event related potentials) are not yet regularly used to identify SPDs due to the equipment and expertise required to make such measurements. These methods are certainly not available to schools. While such methods provide a direct scientific measure of a child's response they require measuring equipment and skills that were not available within the limitations of this research project.

Franklin et al.'s (2008) observations that many children with SPDs are also observed to have behaviour difficulties indicates that it is essential that the measures of sensory processing actually record sensory difficulties and not just behaviours common in BESD children that may stem from a variety of causes. The Sensory Profile does not directly measure a sensory deficit. However, research has shown a close correlation between SPDs identified through observations of children's behaviour and direct sensory deficits measured in a laboratory (Davies & Gavin, 2007), which indicates that information gathered from observations of children's behaviour may be pertinent. Davies & Gavin concluded that differences in brain activity correctly distinguished typically developing children from those with an identification of SPDs (made through behavioural observations) with 86% accuracy.

SPDs may also be investigated through individual assessment by an occupational therapist. However employing an occupational therapist to assess over 100 children would not have been practical. Detailed individual assessment to establish a formal diagnosis of Sensory Processing Disorder was beyond the scope of this study. Instead, data were gathered through the medium of screening questionnaires.

3.1.3.a The Sensory Profile and Short Sensory Profile

As has been noted above, SPDs may be assessed by a number of different methods, but it was decided that the most practical method was to obtain ratings of the child's observed sensory behaviour. To establish prevalence of SPDs two standardised screening questionnaires, the Short Sensory Profile (SSP) and Sensory Profile, School Companion (SC), were used.

The Sensory Profile is a 125-question caregiver questionnaire which was developed between 1993 and 1999 by Winnie Dunn, occupational therapist. '*The Sensory Profile provides a standard method for professionals to measure a child's sensory processing abilities and to profile the effect of sensory processing on functional performance in the daily life of the child'* (Dunn, 1999, p 1). The sensory profile was standardised using a sample of 1,037 children in America without disabilities. From the Sensory Profile, the SSP was developed which is a 38-question caregiver questionnaire which has become accepted as an appropriate tool for screening and research (Tomchek & Dunn, 2007). The reliability and validity of the SSP are reported to be excellent (Ahn et al., 2004). Examination of the internal validity of the SSP indicated that the different sections of the SSP '*tap relatively unique constructions*' (Dunn, 1999, p69). Of particular relevance to this study is the fact that, during the development of the SSP, all the items relating to social and emotional behaviours were removed '*because although these behaviors are related to sensory processing, they are products of the sensory modulation process rather than direct sensory events*.' (Dunn, 1999, p 59). Examination of individual items on the SDQ and SSP indicates that only one item has similar content on both questionnaires, which indicates that the SSP is not duplicating BESD information gathered in the SDQ.

It has been found that children who have been identified as having SPDs through OT assessment can be effectively distinguished from children without SPDs through directly measuring their physical responses to sensory stimuli (Parush et al., 2007; McIntosh et al, 1999; Miller et al., 1999; and Davies & Gavin, 2007). Dunn (1999) reports that children who are found to have abnormal electrodermal responses score significantly lower on the SSP, which is evidence for the construct validity of the SSP, i.e. that it actually measures the underlying construct that it claims to measure. Dunn (1999) also found that the SSP effectively discriminated between typical children and those identified as having SMDs through OT assessment, as children with SMDs had significantly lower mean scores on all sections. This lends weight to the argument that the SSP does provide an effective measure of SPDs and does not simply measure behaviours common in children with BESD. It also shows that the sensory profile has been validated against more detailed methods of identifying SPDs. It is acknowledged that use of a screening questionnaire does not provide in depth knowledge in the way that a detailed individual assessment with each child could do. Hence, the results of this study should be reported with caution. The limitations of the Sensory Profile Questionnaires are discussed in Section 3.1.3c and 5.10.3.

The SSP is designed to be used with pupils between the ages of 5 and 10 years old. Hence, to be included in the study, children needed to be in this age range at the time that the questionnaire was completed.

The SSP provides scores for the following areas:

Table 3:

Sections on the Short Sensory Profile

	SSP Section.
1	Tactile Sensitivity (Touch)
2	Taste or Smell Sensitivity
3	Movement Sensitivity
4	Under-responsive to sensory input or Seeks Sensation
5	Auditory Filtering (Listening skills)
6	Low Energy or Weak
7	Visual or Auditory Sensitivity
8	**Total Score**

From this point onwards SSP Section 4, ‘Under-responsive / seeks sensation’ will be referred to as ‘Seeks Sensation,’ for ease of reading. For each item parents rated whether their child ‘Always’, ‘Frequently’, ‘Occasionally’, ‘Seldom’ or ‘Never’ responds in the manner described in the statement. The responses are given a score (Always = 1 through to Never = 5). Scores for all items on each Section are summed to create the Section scores.

On the SSP, low scores indicate difficulties whereas high scores are typical. Like the SDQ all scores can be allocated to three categories**:**

- **‘Typical Performance’** Scores in this range are usual for most children.
- ‘**Probable Difference’**: Scores in this range indicate that the child’s sensory processing is probably different from typical children (between 1-2 standard deviations away from the mean).
- ‘**Definite Difference’**: Scores in this range indicate that the child’s sensory processing is definitely different from what would be expected for typical children (more than 2 standard deviations away from the mean).

The cut-off for the ‘Definite Difference’ category only includes 2% of the standardisation sample, which is a stricter cut-off than for the ‘Abnormal’ category on the SDQ. This suggests that the SSP is less likely to produce false positives than the SDQ, indeed due to the stringent cut-offs suggested by the SSP’s author, it is possible that the SSP may produce some false negative results. It is suggested that the chance of false positive and false negative results occurring would be reduced if it had been possible to thoroughly individually assess each child.

3.1.3.b The Sensory Profile School Companion

In 2006 the Sensory Profile School Companion (SC) was developed, which is a 62-question teacher questionnaire, again developed from the Sensory Profile. The SC was standardised using a sample of over 700 children from across the USA in 2005-6. 118 teachers completed the rating scales and the sample included children with and without disabilities (Dunn, 2006). Dunn (2006) found moderate correlations between the Sensory Profile and the SC. As Dunn explains ‘*It was expected that there would be small to moderate correlations between the ratings from the parent and teacher because the home and school are two different contexts’ (*p 89). Unlike the SSP, no study to date has examined the SC to establish a correlation between abnormal electrodermal responses and low scores on the SC. This means that the

SC has been less rigorously validated against direct measurements of SPDs, which limits the conclusions that can be safely drawn during the interpretation of the results. The SC is designed to be completed by teachers and used with pupils from 3-11 years old. Individual items on the SC are added to provide scores for the following areas:

Table 4:

Sections on the Sensory Profile, School Companion

	Sensory Processing Sections
1	Auditory (Hearing)
2	Visual
3	Movement
4	Touch (Tactile)
5	Behaviour

Like the SSP, low scores on the SC indicate difficulties. Again, all scores can be allocated to three descriptive categories, ‘Typical’, ‘Probable Difference’ and ‘Definite Difference’. The individual items on the SC can be added in a different way to provide Quadrant Scores and School Factor Scores. Hence, for example all the items that relate to ‘Tolerance for Sensory Input’ are summed regardless of whether they refer to auditory, visual or movement skills etc. In this way scores for the following areas are also provided:

Table 5:

School Factors and Quadrants on the SC

	School Factor Sections		Quadrant Sections
6	Sensory Seeking & Registering Sensory Inputs	10	Registration of Sensory Inputs
7	Awareness & Attention	11	Sensory Seeking
8	Tolerance for Sensory Input	12	Sensitivity
9	Availability for Learning	13	Avoiding

Scores for these sections can also be categorised into the same three descriptors as all the other sensory processing scores. Due to the large number of sections on the SC it was decided not to analyse the Quadrant Scores. This was because there is considerable overlap between the School Factor Sections and topics of the

Quadrant Sections and so little detail was lost by reducing the number of SC factors that were included in the final data analysis.

3.1.3.c Limitations of the Standardised Measures

All the standardised measures in this study (the SDQ, SSP & SC) were designed to be screening questionnaires. Therefore, the data cannot be seen as providing a formal diagnosis of sensory processing disorder or any BESD diagnosis such as conduct disorder, as these should ideally be identified through individual assessment. Brief questionnaires can not provide the same level of rigour as data that is collected through direct individual assessment of each child. However, the SDQ and SSP have been validated against samples where children have been diagnosed through individual assessment (e.g. Goodman & Scott, 1999; Dunn, 1999 and Davies & Gavin, 2007). In addition the SSP has been validated against the direct measurement of sensory responses (e.g. Dunn, 1999). As described in section 3.1.2 the SDQ has been found to be a useful screening tool (Goodman & Scott, 1999) which was successful in identifying 70% of children with hyperactivity, conduct disorders, depression and some anxiety disorders (Mathai et al., 2002). While Mathai et al.'s research demonstrates the SDQ's use as a screening tool, it does suggest that approximately 30% of children in a sample may not be correctly identified by the SDQ. Hence, it is possible that a few children may have been incorrectly identified as having BESD on the SDQ and hence included in this study without actually having significant BESD.

Similar concerns apply to the SSP and SC, which are also screening materials. The SSP's construct validity has been found to be good (Ahn et al. 2004; Dunn, 1999) for example when compared with identification of SPDs through direct measurement of sensory responses (Dunn, 1999), however no equivalent study has been done in relation to the SC meaning that the construct validity of the SC has been less rigorously validated. Therefore, it should be assumed that the teacher sensory results generated by the SC may be less reliable than the parental responses on the SSP.

The results are subject to issues common to all research using questionnaires such as response bias and prestige bias as discussed in section 3.3.

All the standardised measures were brief, meaning that the complexity of individual children's difficulties may not be reflected in the results. Although the SSP is an accepted tool for research (Tomchek & Dunn, 2007 and Ahn et al., 2004), it only includes 38 questions compared to the full Sensory Profile which has 125 questions. Therefore, the data provided by the SSP are not as comprehensive as the full Sensory Profile. It was decided that the full sensory profile would not be appropriate due to the time required to complete the profile. Such a lengthy questionnaire would be likely to discourage parents from taking part, particularly as the schools reported that some parents who participated in the study had limited literacy skills. It is acknowledged that the Sensory Profile only provides the adult's views, based on their perceptions of the child's behaviour. The resulting data represent parental and teacher subjective perceptions, but these individuals are in the privileged position of having observed a child's behaviour over time and in many different situations. Lastly it should be noted that both the SSP and the SC were standardised in the USA and not in the UK. In addition, the SSP was standardised between 1993 and 1999; hence is at least 12 years old. The SC standardisation is 5-6 years old. It would have been ideal if this assessment had been recently standardised on a UK sample, however at the time of writing no UK standardised measure of sensory processing difficulties was available.

3.2 Method

Prior to recruiting participants a research proposal was presented to the Cardiff University School of Psychology Ethics Committee. The Ethics Committee suggested a number of amendments which were made. The project was approved by the ethics committee on 14th September 2010. Specific ethical considerations are discussed in point 3.4.

3.2.1 General information

3.2.1.a Geographical Context

The research took place in a small local authority in central England which was comprised of an urban area with only a few outlying villages. It contained a total of 65 schools catering for children of primary age (4-11 years old). Of the 65 schools, 3 were special schools, one for children with severe and profound learning difficulties, one for children with significant social interaction and communication difficulties and one for children with persistent BESD.

3.2.1.b Inclusion Criteria

In order to take part in the research, pupils had to meet the following criteria:

- The child had to be between 5 years 0 months and 10 years 11 months at the time that the questionnaire was completed;
- Written parental consent had to be granted for each child;
- Teacher consent had to be granted prior to completing the teacher questionnaire;
- Only children who had been observed to have BESD at school could be nominated;
- The nature of the child's BESD was then measured using the SDQ. Only children who were rated as having at least one score in the 'abnormal' category on the 6 measures on the SDQ were included in the results.

3.2.1.c Questionnaire Packs

Approximately 200 questionnaire packs were initially made up ready to be distributed to parents. The Parental Questionnaire Pack included:

- A Parent / Carer Introductory Letter (Appendix 2a);
- Parent / Carer Consent Form (Appendix 2b);
- Parental Background Information Sheet (Appendix 1c);
- The Short Sensory Profile.

Teacher Questionnaire Packs were made up for specific children, for whom parental consent had been provided. The Teacher pack included:

- Teacher Introductory Letter (Appendix 3a);
- Teacher Consent Form (Appendix 3b);
- Teacher Background Information Sheet (Appendix 1d);
- Strengths and Difficulties Questionnaire (Appendix 1a);
- Sensory Profile School Companion.

All questionnaires were marked with a unique identification number and a sticker was applied requesting that participants did not write the child's name on the questionnaire.

3.2.2 Recruitment Procedure

Participants were recruited for the study through three types of organisations as described below. The researcher was available to support professionals involved in recruitment, if parents required any further clarification or if professionals were concerned about approaching particular parents.

The final deadline for returning questionnaires was 1st June 2011 and no questionnaires were accepted after this date.

3.2.2.a Mainstream Schools

The researcher approached the special needs coordinators (SENCos) and head teachers of 10 schools where she was known professionally. The research was explained and all the schools agreed to take part in the study. The researcher offered to attend a staff meeting to explain the project to all school staff, but only 4 schools felt that this was necessary.

SENCos were asked to liaise with class teachers to identify pupils who were considered to have BESD. Care was taken to ensure that class teachers selected the pupils that they thought had BESD prior to being told that the research was investigating SPDs. This was to prevent teachers inadvertently selecting children who demonstrated sensory behaviours rather than BESD. The number of children identified in each school varied considerably depending on the size of the school and the number of children within the school who were identified as experiencing BESD. SENCos were given as many parental questionnaire packs as they estimated were required. Any unused questionnaires were returned and more packs could be requested if needed.

The exact method of distribution varied between schools. In the majority of schools SENCos personally handed over the questionnaires when the parents visited the school, for example during a parent / teacher evening. Taking the time to explain the research individually with parents was found to the most effective way of achieving informed consent. In cases where parents had little direct contact with the school the packs were sent home by post. Schools were asked to ensure that all questionnaires had been distributed between September 2010 and May 2011.

In order to ensure that enough participants took part, the study was gradually extended to include other schools in the local authority throughout 2011. Care was taken to ensure that pupils were selected from a variety of schools ranging from the most affluent to those that covered the most deprived catchment areas. The level of deprivation for each school was taken from the Index of Multiple Deprivation figures provided by the local authority. Data were collected on pupils from 39 primary schools. 33 of the schools were mainstream schools and five were mainstream schools that also contained provision for a small number of pupils with significant special educational needs. One school was a special school for BESD. No participants were included from the special school for social communication and interaction difficulties or the special school for severe and profound learning difficulties.

3.2.2.b The Primary Behaviour Support Team (PBST)

The recruitment of participants was supported by the PBST who suggested the inclusion of all new referrals to their service. The PBST consisted of two teachers and approximately eight teaching assistants who were available to support all primary schools across the local authority. The PBST received referrals directly from schools when it was felt that they needed specialist support with individual BESD pupils. The researcher attended a PBST team meeting to explain the research. It was agreed that members of the PBST would ask the parents of all children referred to them (between September 2010 and April 2011) to take part in the research. The PBST professionals discussed the research with the parent and handed out a parental questionnaire pack to parents who were prepared to take part. Once parental consent had been gained, the PBST member handed out teacher questionnaire packs to the child’s class teacher. Complete data was received for 29 participants from the PBST.

3.2.2.c Special School for Children with BESD

Within the borough there was one special school for pupils with persistent BESD; the researcher worked closely with the SENCo of this school. All parents of children in the correct age range were invited to take part in the study. The SENCo personally approached all the parents and asked them to come into school to consider the forms and complete the questionnaires, if they consented to take part. Once parental consent had been gained the SENCo asked the child’s class teacher to complete the teacher questionnaire pack. Complete data was received for 20 pupils from the BESD special school, however data for only 18 pupils were included in the analysis because two pupils were rated as not having BESD.

3.2.3 Distribution and Completion of Questionnaires

During the distribution and completion of questionnaires the following steps were taken.

- The purpose of the research was explained to parents in person and/or through the covering letter.
- If parents did not consent to take part, no further action was taken.
- If parents provided written consent, they were asked to complete and return the Parental Background Information and the Short Sensory Profile.
- If parents failed to respond within 7-10 days a verbal reminder was given and duplicate forms provided if requested. If parents did not respond to the verbal reminder, it was assumed that they did not want to take part.
- Schools returned the signed consent forms and parental questionnaires to the researcher. On receipt, a confidential record was made of the child's name, School and Year group (taken from the consent form) and unique identification number (written on the questionnaires).
- The consent forms were separated from the questionnaires and filed separately.
- The list of the children's names and identity numbers was stored electronically so that a teacher questionnaire pack with the corresponding identification number could be made up and sent out for each child.
- Once a teacher pack had been made up, a letter of thanks was sent to the parents and the child's details were deleted from the confidential list.
- SENCos gave the teacher pack to the member of staff within the school who knew the child best. Again the purpose of the study was explained in the covering letter.
- The teacher signed the consent form if he / she was happy to take part and then completed the questionnaires.

All completed questionnaires were returned to the child's school, where they were usually personally collected by the researcher. Addressed envelopes were provided to all schools so that any stray responses could be returned by internal mail.

3.3. Methodological Issues Relating to the Use of Questionnaires

Questionnaires provide an effective method to investigate the views of large numbers of people at low cost. However, they present a number of drawbacks as a method of collecting data. A common criticism of the use of questionnaires is that often there is a very poor response rate (Thomas, 2009), which means that results may only represent the views of a small percentage of the population and hence does not provide an accurate account of the situation. As stated by Robson (2002) every effort should be made to obtain as high a response rate as possible.

The following precautions were planned to try to maximise the questionnaire response rate:

- Where possible questionnaires were personally given to parents when they were visiting the school. Parents who were happy to take part were encouraged to complete the questionnaires promptly.
- Parents and teachers who had not returned the questionnaire within 7-10 days were given a verbal reminder. Duplicate forms were provided if requested.
- Participants who preferred not to take part were asked to return blank questionnaires so that the SSP could be used by other families.
- Training on SPDs was offered so that staff had further understanding about the issues raised in the study. Also the offer of free training presented an incentive for schools to take part.
- After the parental questionnaire packs had been distributed in 4 schools, it was noted that the response rate was significantly higher for the schools which had nominated less than 20 pupils to take part. SENCos reported that nomination of fewer pupils enabled them to be more personally involved in the distribution of the questionnaires. Hence, it was decided to encourage schools to nominate only a moderate number of pupils and to widen the data collection to include more schools.

3.3.1 Participant Bias when Completing Questionnaires

It is known that questionnaires are subject to response bias (Robson, 2009) and 'prestige bias' (Thomas, 2002). Response bias refers to the fact that some types of participant are more likely to respond to the questionnaire than others. In this survey it was noted that parents who had a good relationship and regular contact with the school were much more likely to complete the questionnaires. This is because parents tended to respond more positively to the suggestion of taking part in a research project if they had a positive relationship with the professional introducing the research (usually the school SENCo). Also, parents with a poor relationship with the school rarely visited the school for meetings and hence the questionnaires often had to be sent home rather than given out personally. In many cases, parents of the most challenging children did not view the school in a positive light and so were not receptive to taking part in the research. Another issue was poor levels of literacy of a number of parents. Where schools were aware of poor literacy levels they endeavoured to support the parents in completing the questionnaires. However, parents may have been reluctant to admit their literacy difficulties to schools and in these cases they would have found it difficult to effectively complete the questionnaires.

Children were nominated to be included in the research by the child's class teacher. It is acknowledged that teachers may have been biased when nominating certain pupils. For example, they may focus on children who are overtly challenging in school and pay less attention to withdrawn children with emotional or social needs. Also, some parents were not approached because the relationship between the parents and the school was so fragile. As a result of all the factors mentioned above, some of the most vulnerable families with poor literacy levels were less likely to take part. Hence, the sample included in this research is likely to favour children with only moderate BESD and those whose parents who have a reasonable relationship with the school.

'Prestige bias' addresses the issues surrounding the way participants respond to individual questions, in that participants may veer towards giving answers that portray them in a positive light, rather than providing an accurate account. In this study it is possible that some participants may have been reluctant to provide answers that they felt might portray a negative image of their family. Alternatively, concerned parents may over-emphasise a child's difficulties or try to provide the answers that they think are pertinent to the outcomes for their child, such as the level of support that the child receives at school. Collecting sensory data from both parents and schools was hoped to enable a more balanced view of a child to be collected, than might have occurred if data had only been provided by one party.

3.4. Ethical Issues

The following ethical issues were considered when planning the research design.

3.4.1 Recruiting Parents

Mainstream schools were sensitive about initially approaching parents, because the study only involved children who were regarded by the school as having BESD. Schools did not ask parents to take part in the research unless they had previously discussed with the parents the school's concern about the child's behavioural, emotional or social difficulties. Schools were clear about why they felt that the research was relevant for each child, for instance in some cases there were no behavioural difficulties, but the school was concerned about the child's social skills. Guidance was written to support schools in approaching parents (Appendix 4) and the researcher offered to directly support schools if required. Only one parent expressed concerns and requested to speak to the researcher directly. After further explanation of the aims of the study he chose to consent to take part.

Many schools raised a number of children with fairly severe BESD who they felt should be included in the study. However, in some cases it was acknowledged that the relationship between the family and the school was very fragile and that it would not be prudent to complicate the situation by requesting parental participation in a research project.

Additional care was taken to be considerate of families' personal situations which may have affected their ability to respond. If a family was known to be under particular stress (for example due to bereavement or the result of family break up) they were not asked to take part in the research.

Although it was found that personally explaining the research to parents was the most effective way to achieve their agreement to take part in the study, all SENCos were instructed to be very careful to avoid parents feeling that they had been pressurised to take part. It was emphasised that taking part in the research was entirely voluntary and if parents preferred not to take part, their decision would not affect the support given to their child in school. If a parent was unsure about how to proceed, it was suggested that they took the questionnaire pack home to consider it, in case the parent felt awkward about saying ‘No’ to school staff in a face to face meeting.

3.4.2 Consent

- Parents were asked to provide written consent before any questionnaires were completed. Where parents indicated that they did not want to take part, no further action was taken. If parents did not respond, only one verbal reminder was given and then it was assumed that they did not want to take part in the study.
- Teacher packs were only distributed when parental consent for the child in question had been received.
- Teacher questionnaires were only marked if written teacher consent had been provided.
- Care was taken to ensure that consent was properly informed, particularly for parents who were known to have learning difficulties or poor literacy skills. In such cases, school staff carefully described the research and acted as a reader and scribe if necessary when completing the questionnaires.

3.4.3 Managing Parent and Teacher Concerns

The researcher was available if parents or teachers had concerns about taking part in the study. All SENCos supporting the study were given access to general training sessions on sensory processing in typical children and how to recognise and support children with SPDs. This gave teachers confidence in understanding SPDs and in how to manage enquiries from other staff and parents. In addition, the training provided opportunities for informal question and answer sessions and for SENCos to share experiences with other schools.

SENCos were only allowed to attend training once the list of participants from their school had been decided in order to ensure that their attendance on the training did not influence the class teachers prior completing the questionnaires. Class teachers who showed an interest in SPDs as a result of the study were welcome to attend training, but only after they had returned all their completed questionnaires so as to prevent the training affecting their responses. Five training sessions were offered in total and training delivered to 38 SENCos, seven teachers and six members of the PBST.

3.4.4 Management of Confidential and Anonymous Data

Parental Questionnaire Packs were distributed by SENCos to the parents of children nominated by the school to take part. Parents signed and wrote the child's name on the consent forms. No names were written on the questionnaires. Instead, they were marked with a unique identification number. Once the pack was returned, the researcher immediately recorded, on a confidential electronic list, the child's name, school, year group and identification number. The consent forms were then filed separately to the questionnaires. Hence, information provided in the questionnaires was anonymous unless the viewer had access to the confidential list of names and unique numbers. This confidential list was kept (completely separate from the questionnaire data) on the educational psychology server at the local authority educational psychology service. The list was password protected so that only the researcher had access to pupils' personal details.

The confidential list of all participants was retained by the researcher until the End of Study Feedback Letter (Appendix 5a) was sent out to parents, at which point the child's details were deleted from the list, so that it was not possible to trace the data back to individual participants.

All completed questionnaires were taken from the school to the researcher's home and stored in a lockable filing cabinet. Questionnaire data were entered into a database using SPSS within one week of receipt by the researcher. The anonymous data were stored on the researcher's personal computer and password protected.

3.5 Questionnaire to Establish SENCos' Knowledge about SPDs: study B

In order to answer Research Question 4, all SENCos across the borough were asked to complete a brief questionnaire about their understanding of SPDs (Appendix 1b). This was distributed by local authority educational psychologists at their annual school planning meetings in September and October 2010 before the start of study A and hence before any training had been delivered. A total of 65 SENCo questionnaires were distributed. A return envelope was provided.

The consent form for SENCos indicated that by completing the questionnaire they were consenting to take part in the study. Assumed consent was acceptable because this questionnaire was very brief and totally anonymous. Insisting on written consent would have complicated the study unnecessarily. Anonymity was important for this questionnaire because SENCos may have been reluctant to admit to lack of knowledge if the data could have been traced back to them.

3.5.1 Constructing the Questionnaire

The questionnaire was arranged in the manner of a 5 point Likert Scale, where participants could state to what extent they agreed or disagreed with the statement. The first five statements investigated SENCos' understanding of the following specific terminology:

- Sensory Processing Disorder (also known as Sensory Integrative Dysfunction);
- Sensory Modulation Disorder;
- The Vestibular Sense;
- The Proprioceptive Sense;
- Tactile Defensiveness.

All the terms chosen are central to understanding theories of sensory processing and yet unlikely to be known in common parlance. The last four statements were intended to investigate whether SENCos and other school staff had appropriate knowledge and resources to support SPDs.

The questionnaire was piloted with 3 SENCos from outside the local authority. No issues were raised with it, hence no amendments made. The End of Study Feedback for SENCos Letter (Appendix 5b) was sent out approximately four weeks after the SENCo questionnaires were distributed.

3.6 Recording and Analysing the Data

The data were entered into *Statistical Package for the Social Sciences 18* (SPSS). Data were collected for a total of 184 children. Data for 26 children were excluded because the school questionnaires were either incomplete or had not been returned and so no measure of BESD was provided. Without this measure it was not possible to ascertain whether the children had BESD or not and hence whether they met the research inclusion criteria. 14 pupils were excluded because all their scores on the SDQ fell into the ‘Normal’ or ‘Borderline Range’, meaning that they did not meet the inclusion criteria for the study. For a further 12 pupils the parental data were incomplete. However, if all the required questions for an SSP Section had been completed, the Section total was included in the analysis. For this reason, the total number of participants on each of the parental measures varied from 131 to 135.

Individual question scores on the SDQ, SSP and SC were totalled so that a score for each Section could be calculated. All three assessments allow for the child’s score to be allocated to one of three categories. The SDQ describes scores as being ‘Normal’, ‘Borderline’ (Approximately the top 10-20% of scores on the standardisation sample) or ‘Abnormal’ (Approximately the top 10% of scores on the standardisation sample). The SSP and SC describe scores as being ‘Typical’, ‘Probable Difference’ (1-2 standard deviations from the mean, 2nd to the 16th percentile) or ‘Definite Difference’ (>2 standard deviations from the mean, 1st to 2nd percentile).

Six measures of BESD were calculated including a total BESD score. The SSP provided eight measures including a total sensory difficulties score and the SC provided nine measures of sensory processing. The SC did not provide a total sensory processing score and hence it was not possible to directly compare the teacher and parental overall scores for sensory processing. It was decided that a total teacher sensory processing score would be helpful. This was calculated in the same way as the SSP Total Score by adding the five scores relating to the different senses (Auditory, Visual, Movement, Touch and Classroom Behaviours). The standard deviation for each scale was also summed and cut-off scores set for 'Probable Difference' and 'Definite Difference' by summing the cut-off scores for the individual Sections. In line with all the other sensory scores the 'Probable Difference' range was between 1-2 standard deviations from the mean and 'Definite Difference' was calculated to be more than 2 standard deviations from the mean. Hence a 10th measure was created for the SC, which allowed comparison of the total sensory scores provided by parents and schools. While a Total SC score is useful to provide an idea of how the percentage of children with total difficulties on the SSP compares with total difficulties on the SC, it is acknowledged that the Total SC score provides a summary of a range of sensory issues and hence presents a construct that is multi-dimensional. If the concepts measured by the individual Sections were not conceptually linked in Dunn's model of sensory processing, the creation of a total measure that provides a summary of the Sections would not be meaningful. However, sensory processing theory proposes that children may present with a variety of difficulties in different sensory areas (Miller, 2007). The fact that the difficulties measured on the individual Sections of the SSP are summed to create an overall summary of the child's sensory issues suggests that it is not conceptually problematic to also calculate a total summary score for the SC.

3.6.1 Recoding Ordinal Data into Categorical Data

The main aim of this research was to establish how many pupils with BESD have sensory difficulties. Hence, it was necessary to establish how many children fell into the category of having a 'definite difference' on their sensory processing score. The 'definite difference' category was adopted from the Sensory Profile and only includes children whose standardised scores were over 2 standard deviations from the mean. This means that in the general population, only 2% of children would be expected to score as having a 'definite difference'. This cut off has also been used in other research involving the SSP such as Tomchek & Dunn (2007) and Ahn et al. (2004).

In order to establish the categories that children's scores fell into, all the scores were recoded into three categories indicating whether the score was 'typical', indicated 'probable difficulties' or 'difficulties'. The three questionnaires were designed to produce scores with the descriptors shown in Table 6 below:

Table 6:

Descriptive Categories on the SDQ, SSP and SC

SDQ	Normal	Borderline	Abnormal
SSP	Typical	Probable Difference	Definite difference
SC	Typical	Probable Difference	Definite difference

It was decided that for the sake of clarity and ease of description of the results that the following descriptors would be used for all questionnaires.

New descriptor after recode	Typical	Probable Difficulties	Difficulties

While use of the same descriptors for all three questionnaires improves the ease of reading in the results and discussion of this study, it is acknowledged that use of the same terms masks the differences between the cut-offs set for the different questionnaires. It should be remembered that the SDQ has a more liberal categorisation of children with difficulties (approx. 10%) whereas the SSP and SC have more stringent cut-offs (2%). This means that the descriptor ‘Difficulties’ for the SDQ is more likely to have produced false positives than the SSP and SC. In addition possible inaccuracies in how the results are perceived may have been introduced due to readers perceiving the term ‘Difficulties’ slightly differently from what was intended by the original terms ‘Abnormal’ and ‘Definite Difference’.

Frequency distribution tables were then calculated so that the number and percentage of pupils falling into each category could be calculated. Hence, the prevalence of SPDs for children with BESD could be calculated by working out the percentage of participants that fell into the ‘definite difficulties’ category.

3.6.2 Pearson’s Chi-square Test

In order to see if there was an association between children with SPDs and other factors, both sensory and BESD data were recoded into binary categories of ‘Typical or Probable Difficulties’ and ‘Difficulties’. Although recoding into binary categories was necessary for analysis, it is acknowledged that the process results in some loss of detail in the data. Pearson’s chi-square test was used to analyse whether there was an association between the sensory scores provided by parents and those provided by teachers. The chi-square test was also used to ascertain whether there was a significant association between SPDs and other background factors. The process of recoding the data into categories altered the data from ordinal to nominal data, hence only statistics designed to analyse nominal data could be used.

Pearson's chi-square test investigates whether there is a relationship between two categorical variables. Field (2009) states '*This is an extremely elegant statistic based on the simple idea of comparing the frequencies you observed in certain categories to the frequencies you might expect to get in those categories by chance*' (p 688). The multi-dimensional chi-square tests allow investigation of whether nominal variables are independent of each other, through use of the null hypothesis which assumes that there is no relationship between the two variables (Brace, Kemp & Snelgar, 2009). A level of significance is then calculated, which indicates the probability of the results occurring by chance (Mulhern & Greer, 2011). It is generally accepted that a probability score of 0.05 is an acceptable cut-off for significance (Field, 2009; Brace et al. 2009; and Mulhern & Greer, 2011), indicating that there is a probability of less than 5% that the results occurred by chance.

In order to use the chi-square test it is important the following criteria are met. Data must be nominal so that the frequency in which each category appears can be recorded; the categories must be mutually exclusive and every observation must be independent of other observations. Hence, the chi-square test is not appropriate for designs including repeated measures (Brace, et al., 2009). It should also be noted that although the chi-square test provides information about the association between variables, it does not indicate a causal relationship (Brace, et al., 2009).

The chi-square test has been criticised for producing significance values that are too small when a 2x2 contingency table is used (Field, 2009). Yates's Continuity Correction was devised to rectify this. However, Field states that Yates's continuity correction tends to overcorrect and hence does not present a useful improvement on the chi-square test.

The chi-square test is appropriate for analysing associations between most of the variables in this study. However Research Question 3 seeks to establish associations between children found to have SPDs and other background factors such as a diagnosis of Autistic Spectrum Disorder. For many of these factors only a very small number of children were rated as having a background difficulty. This meant that in several cases more than 25% of the expected frequency counts on the chi-square test were below 5. The chi-square test is not considered to be accurate for very small numbers (Dancey & Reidy, 2011). As explained by Field (2009) the chi-square test produces an approximate chi-square distribution:

> '*in small samples, the approximation is not good enough, making the significance tests of the chi-square distribution inaccurate…When the expected frequencies are greater than 5, the sampling distribution is probably close enough to a perfect chi-square distribution for us not to worry*' (p 690).

When more than 25% of the expected frequency counts on the chi-square test were below 5, Fisher's Exact Test was used to analyse the results. This is because it uses a method that computes the exact probability of the chi-square statistic that is precise even when sample sizes are small (Field, 2009). Hence, this test is more accurate than the chi-square for very small sample sizes.

3.7 Timetable of Research

An overview of the timetable of the research is provided below. Approval for the study was granted by Cardiff University Ethics committee on 14.09.10.

Distribution of the Questionnaires were organised into four groups with approximately 10 schools in each group. This ensured that the time consuming parts of the process (such as meeting with schools, processing the completed parental questionnaires and making up school questionnaire packs) were spread throughout the year (2010-2011).

Table 7:

Timetable of Research Activities

Group 1 Schools	Group 2 Schools	Groups 3 Schools	Group 4 Schools	PBST & other activities
16 Sept SENCo Questionnaire (Study B) sent to Grp 1 schools.				16 Sept SENCo Questionnaire (Study B) was given to EPs to be delivered to all schools during Sept & Oct.
22 Sept – 16 Oct Researcher met SENCos to discuss the research.				
22 Sept – 22 Oct Class teachers made list of BESD pupils. Parental forms sent out for all pupils on the list				19 Nov Researcher met PBST to discuss the research. PBST gradually distributed parental and school forms for children referred to their service between 1 Sept 2010 and 30 April 2011.
1 Nov – 30 Dec Parental forms returned & school forms delivered.	1 Nov – 1 Dec Researcher met SENCos to discuss the research.			
13 Dec All Grp 1 school forms returned.	1 Nov – 12 Dec Class teachers made list of BESD pupils. Parental forms sent out for all pupils on the list			
14 Dec Training delivered to Grp 1 SENCos & PBST members.	13 Dec - 28 Jan Parental forms returned & school forms delivered.	28 Jan – 21 Feb Researcher met SENCos to discuss the research.		

Table 7 continued:

Timetable of Research Activities

Group 1 Schools	Group 2 Schools	Groups 3 Schools	Group 4 Schools	PBST & other activities
	15 Feb All Grp 2 school forms returned.	28 Jan – 4 Mar Class teachers made list of BESD pupils. Parental forms sent out for all pupils on the list		
	16 Feb Training delivered to Grp 2 SENCos, a Grp 1 teacher & 2 PBST members	4 Mar – 28 Mar Parental forms returned & school forms delivered.	11 Mar – 1 April Researcher met SENCos to discuss the research.	
		4 May All Grp 3 school forms returned.	11 Mar – 6 May Class teachers made list of BESD pupils. Parental forms sent out for all pupils on the list	
		5 May Training delivered to Grp 3 SENCos	26 April – 16 May Parental forms returned & school forms delivered.	
			1st June All Grp 4 school forms returned.	
			14 June Training delivered to Grp 4 SENCos & any other school staff who wanted to attend.	28 June Final training session delivered for school staff that had not been free to attend previous sessions.

PSBT = Primary Behaviour Support Team

Chapter 4

Results

A summary of the results of the study is presented here. The full raw data are available from the author. Complete school BESD and sensory data were provided for 144 pupils. Complete parental sensory data were provided for 131 pupils.

4.1 Analysis of Participants

4.1.1 Gender

As shown below, the majority of pupils nominated to take part in the study were boys.

Table 8:

Participants Arranged by Gender

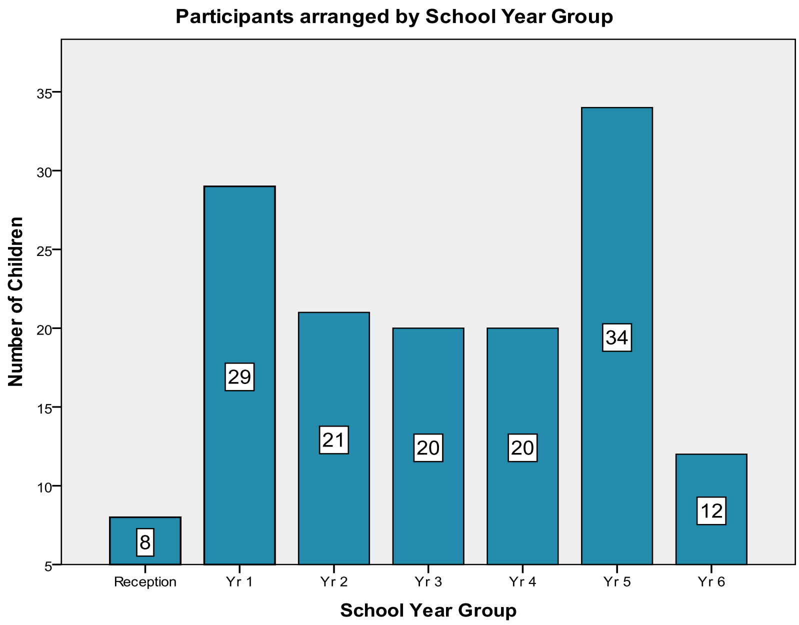
Gender	Number of Total Participants	Number of Participants from mainstream schools	Number of Participants from BESD Special School
Girls	26 (18%)	26 (21%)	0 (0%)
Boys	118 (82%)	100 (79%)	18 (100%)

These figures suggest that BESD is much more prevalent in boys than girls. All the participants from the special school for persistent BESD were boys. This school was coeducational, but at the time of data collection no girls were attending.

4.1.2 Age of Participants

The following chart shows the distribution of participants according to their school year group. Only 6% of the sample was in Reception (4-5 years old) and 8% were in Year 6 (10 years old). It should be noted that SENCos were keen for a large number of Year 6 pupils to take part, but many had to be excluded from the research because they had turned 11 years old, which is too old for the standardisation on the SSP.

Figure 2:



4.1.3 Index of Multiple Deprivation

Participants were drawn from 39 of a total of 65 primary schools across the local authority. The local authority provided data for the relative deprivation of all schools within the borough. Deprivation was measured by the borough's Index of Multiple Deprivation (IMD). The IMD used a number of deprivation indicators, chosen to cover a range of economic, social and housing issues and combined into a single deprivation score for each postcode. The postcode for each pupil in the local authority (as of January 2011) was used to calculate a mean deprivation score per school. Schools were ranked and divided into quartiles according to their IMD score and the number of participants that fell into each quartile was recorded. Table 9, below, shows how many participants were drawn from schools in each quartile.

Table 9:

Breakdown of Participants by Schools, Ranked According to the Index of Multiple Deprivation

Quartile	Percentage of Participants	Number of Participants
1st Quartile, Most Affluent Schools	29%	41
2nd Quartile	13%	19
3rd Quartile	31%	45
4th Quartile, Most Deprived Schools.	27%	39
Total	100%	144

Although these data do not provide information about the personal socioeconomic status of individual children, they provide an indication that the sample represented a fairly equal proportion of children from schools in all types of catchment areas ranging from the most deprived to the most prosperous.

Local authority data showed that in the special school for BESD, 86% of the children were eligible for free school meals whereas the highest free school meal figure in the mainstream schools was 48%. Of the 62 mainstream primary schools in the local authority, only 3 schools had more than 32% of children entitled to free school meals. Only children of low income families are eligible for free school meals, hence the data from the BESD special school would indicate a close link between children with severe BESD and low income families.

4.1.4 Occupational Therapy Assessment

Sensory Processing difficulties are most commonly identified by occupational therapists. Hence it was relevant to ascertain the number of BESD pupils who had been assessed by an occupational therapist, as shown in the table below.

Table 10:

Number of Participants Reported to have been Assessed by an Occupational Therapist (n=144)

Assessed by an occupational therapist	% of participants	Number of participants
Parental Response	23%	33
Teacher Response	14%	20

These scores may be slight underestimates because a number of respondents indicated that they were ‘Not sure’ about the answer to this question. Parents stated that more children had seen an occupational therapist than schools. This is not surprising because children may have been assessed prior to starting school or during the holidays and hence the school would not have been aware of the occupational therapist’s involvement. For 3 pupils, schools stated that they had been assessed by an occupational therapist, whereas the parent was ‘Not Sure’. A likely explanation for this discrepancy is that when children are known to numerous professionals, some parents may find it difficult to remember the role of everyone who has worked with their child.

4.1.5 Types of BESD

The SDQ is made up of five Sections and a total BESD score. A summary of the number of participants rated as having difficulties in each SDQ Section is shown below.

Table 11:

Breakdown of Participants by Type of BESD as Measured by the SDQ (n=144)

SDQ Sub Scales & Total.	% of participants with difficulties	Number of participants with difficulties
Emotional	27%	39
Peer Problems	41%	59
Pro-social Behaviour	47%	68
Conduct Difficulties	51%	74
Hyperactivity	74%	107
Total Difficulties	67%	97

Only 27% of children were rated as having emotional difficulties, whereas the most common BESD was rated as being hyperactivity, in which 74% of participants were felt to have difficulties. Only 67% of participants had overall difficulties with BESD, indicating that 33% of participants were rated as having specific difficulties in one or more of the five SDQ Sections, but their needs were not severe enough to be rated as having overall BESD.

4.2 Prevalence of Sensory Processing Difficulties in Children with BESD

The percentage of children who were rated as having SPDs on the Total Scores for the SSP and SC are shown below.

Table 12:

Prevalence of SPDs as Rated by Parents and Teachers

	Percentage of Children in Each Sensory Category			N - Total Number of children
	Difficulties	Probable Difficulties	Typical	
Short Sensory Profile, Total Scores (Parent Rating)	55%	14%	31%	131
Sensory Profile School Companion, Total Score (Teacher Rating)	44%	39%	16%	144

The figures show that parents rated 55% of participants as having SPDs and teachers rated 44% as having SPDs. Teachers rated that a further 39% of participants had probable SPDs.

4.2.1 Prevalence of SPDs by Demographic Categories

Table 13:

Prevalence of SPDs by gender

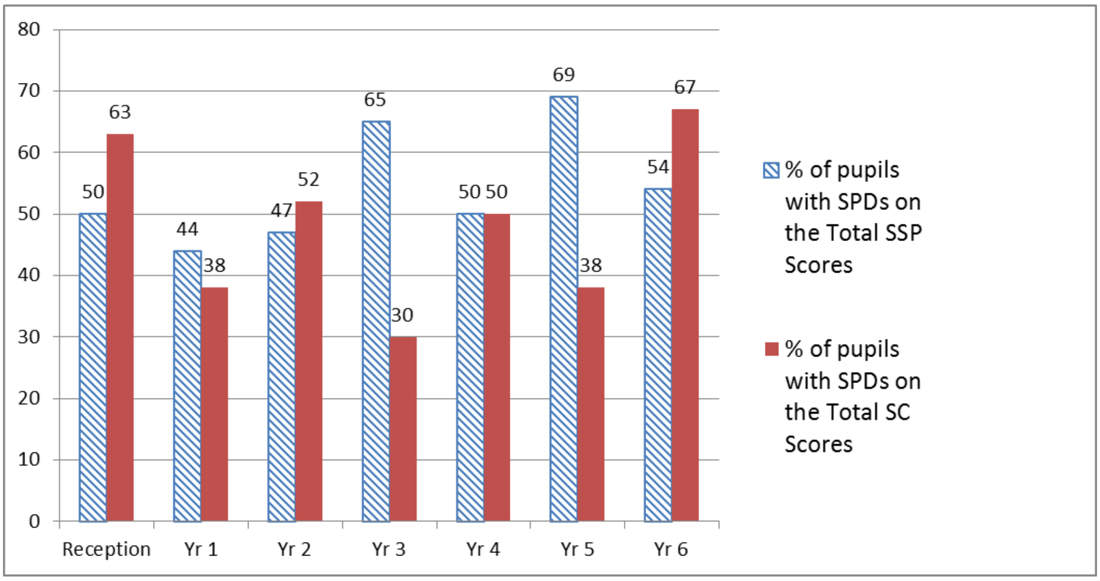
	Pupils with difficulties on the Total SSP Score (girls: n=25 boys: n=106)		**Pupils with difficulties on the Total SC Score (girls: n=26 boys: n=118)**	
	%	Number	%	Number
Girls	48%	12	27%	7
Boys	57%	60	48%	57

As shown in table 13, no significant association was found between the prevalence of SPDs according to gender on the Total SSP Score. However, teachers rated that boys were significantly more likely than girls to have SPDs on the SC, $\chi^2 = 3.95$ (1) $p=.047$, sig <0.05.

Figure 3 shows that the percentage of children rated as having SPDs varies between year groups and depending on whether the data was provided by parents or teachers. No pattern of SPDs is apparent based on the participant's age.

Figure: 3

Prevalence of SPDs by School Year Group using the SSP and SC Total Scores



The scores for total SPDs on the SSP and SC were calculated for the school Index of Multiple Deprivation (IMD) for each pupil as shown below. The total measure for BESD was also compared to the IMD.

Table 14:

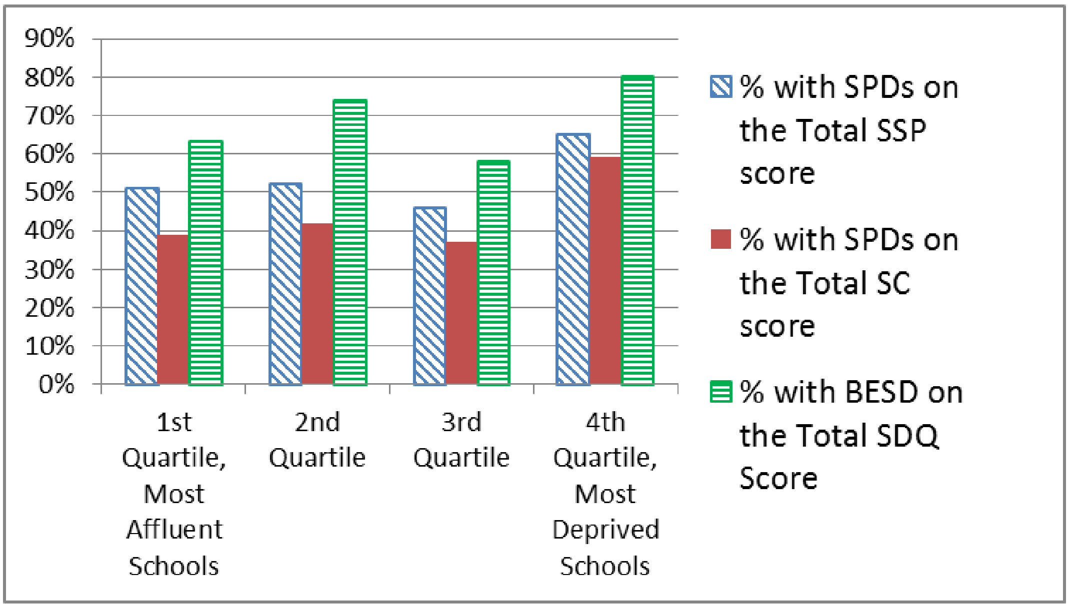
The Percentage of Pupils with SPDs and BESD according to the Index of Multiple Deprivation Score for the Pupil's School

Quartile	N pupils in each quartile	% with SPDs on the Total SSP Score	% with SPDs on the Total SC Score	% with BESD on the Total SDQ Score
1st Quartile, Most Affluent Schools	41	51%	39%	63%
2nd Quartile	19	52%	42%	74%
3rd Quartile	45	46%	37%	58%
4th Quartile, Most Deprived Schools	39	65%	59%	80%

Although the most deprived quartile has the highest percentage of difficulties on all three measures, there is no obvious trend of BESD or sensory difficulties being less prevalent in participants from affluent schools as is shown in the graph below.

Figure 4:

The Percentage of Pupils with SPDs and BESD According to the Deprivation of the Pupil's School



4.2.2 Prevalence of SPDs on the Sensory Profile Sections

The SSP and SC are composed of a number of Sections. The percentage of participants rated as having SPDs varied considerably for each Section as shown below.

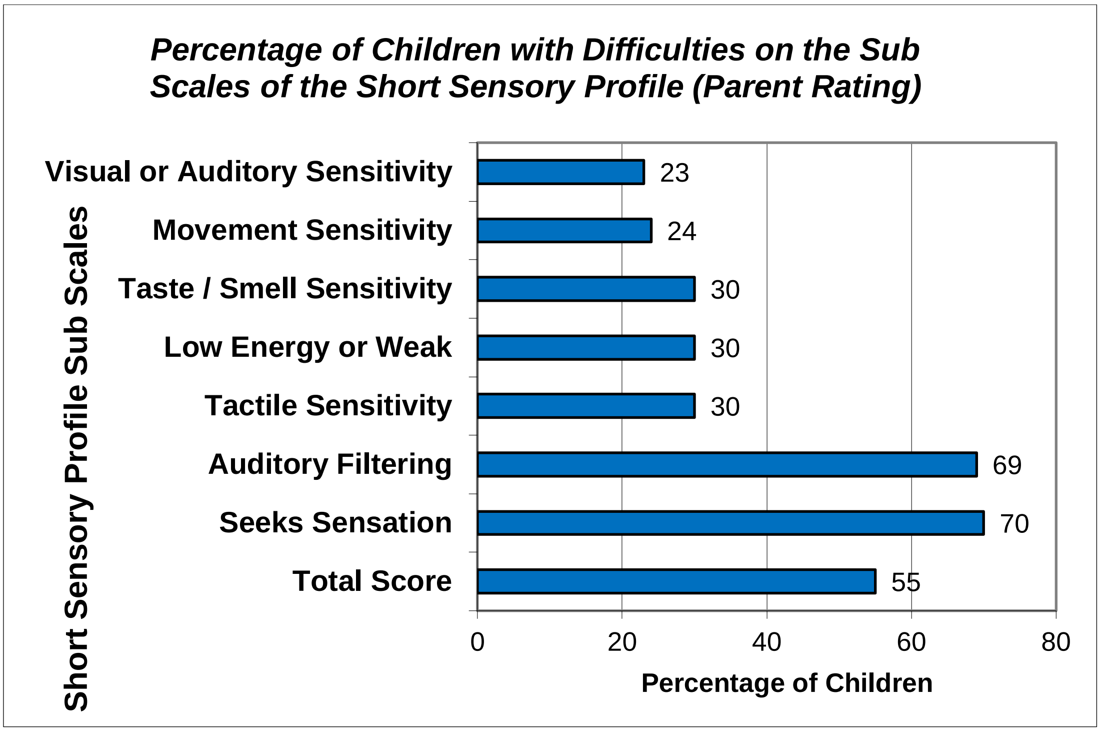
Table 15:

Breakdown of Prevalence of SPDs by Section on the Short Sensory Profile

Short Sensory Profile Sections (Parental Rating)	**Number of Children in Each Category**			N - Total Number of children
	Difficulties	Probable Difficulties	Typical	
Visual / Auditory Sensitivity	30 (23%)	24 (18%)	79 (59%)	133
Movement Sensitivity	33 (24%)	14 (10%)	88 (65%)	135
Taste / Smell Sensitivity	40 (30%)	7 (5%)	87 (65%)	134
Low Energy / Weak	40 (30%)	13 (10%)	80 (60%)	133
Tactile Sensitivity	40 (30%)	34 (25%)	60 (45%)	134
Auditory Filtering (Listening Skills)	92 (69%)	23 (17%)	18 (14%)	133
Seeks Sensation	94 (70%)	22 (16%)	19 (14%)	135
Short Sensory Profile **Total Score**	72 (55%)	18 (14%)	41 (31%)	131

These figures show that between 23-30% of pupils are rated as having difficulties on five of the seven Sections on the SSP. However, a much higher percentage was found for the ‘Auditory Filtering’ and ‘Seeks Sensation’ Sections as is demonstrated by the following graph.

Figure 5:



A summary of the proportion of children found to have difficulties on the SC Sections is shown in Table 16 below.

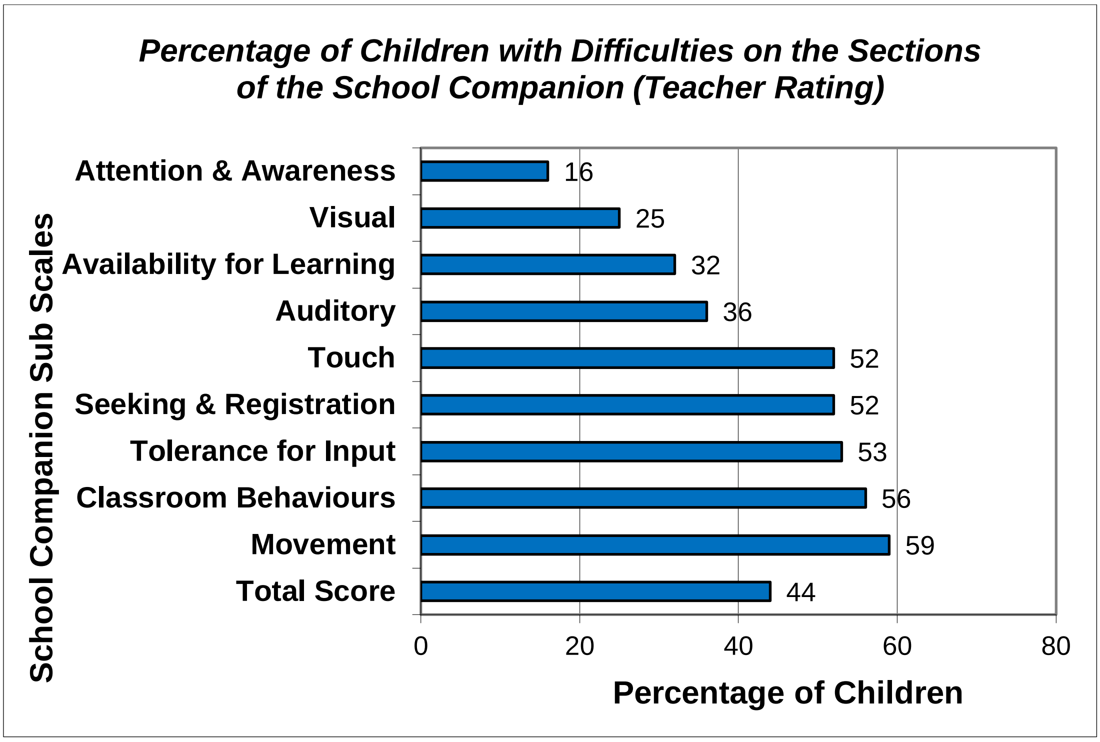
Table 16:

Prevalence of SPDs by Section on the Sensory Profile, School Companion

Sensory Profile School Companion Sections (Teacher Rating)	**Number of Children in Each Category**			N - Total Number of children
	Difficulties	Probable Difficulties	Typical	
Visual	36 (25%)	56 (39%)	52(36%)	144
Auditory	52 (36%)	56 (39%)	36 (25%)	144
Touch	75 (52%)	37 (26%)	32 (22%)	144
Sensory Behaviour	80 (56%)	39 (27%)	25 (17%)	144
Movement	85 (59%)	32 (22%)	27 (19%)	144
Total Score	64 (44%)	57 (39%)	23 (16%)	144
School Factors				
Attention & Awareness	23 (16%)	58 (40%)	63 (44%)	144
Availability for Learning	46 (32%)	37 (26%)	61 (42%)	144
Sensory Seeking & Registration	75 (52%)	39 (27%)	30 (21%)	144
Tolerance for Sensory Input	76 (53%)	38 (26%)	30 (21%)	144

Like the SSP, the percentage of participants with difficulties according to the SC (teacher rating) varies between Sections. ‘Movement’ was rated as the Section with the highest number of children showing difficulties. This contrasts with the SSP results where ‘Movement’ was the Section with the second lowest score. The SC Section scores are given in Figure 6 below.

Figure 6:



4.3 Comparison of the Sensory Scores Provided by Parents and those Provided by Teachers

In this study sensory data on individual children were collected from both parents and teachers. The following section investigates whether there is agreement between the responses provided by parents and teachers.

4.3.1 Comparison of Responses on SSP and SC Sections

The headings on the SSP and SC suggest that there are six sensory measures that are common to the SSP and SC that could be directly compared. The comparable Sections were Tactile, Auditory, Visual, Movement, Seeks Sensation and Total Score. Close examination of the Movement and Visual sections on the SSP and SC, led to concern about whether a direct comparison between the SSP and SC measures was appropriate. For instance, the SSP 'Movement' section primarily investigates vestibular insecurity where as the SC 'Movement' section mainly investigates activity levels and participation in group activities. Likewise the SSP visual section investigates visual and auditory sensitivity, whereas the SC visual section only includes visual information. These issues relating to SSP and SC comparisons are discussed in Chapter 5.

Table 17:

Analysis of Associations between Parent and Teacher Responses on Sensory Measures

Parent and Teacher comparison	Total N	% of pupils rated as having sensory difficulties by			Association of parent & teacher rating scores		
		Teacher & Parent **%**	Parent %	Teacher %	x^2	p	Sig
Total Sensory Score	131	32%	55%	44%	11.42	.001	<.005
Auditory	133	32%	69%	39%	6.74	.009	<.01
Seeks sensation	135	42%	70%	48%	8.04	.005	<.01
Tactile	134	19%	30%	56%	4.17	.041	<.05
Movement	135	18%	24%	63%	3.28	.070	ns
Visual	133	8%	23%	27%	0.77	.380	ns

Notes: ns = non-significant. Non-significant results are shaded. Results were reported as significant if p<.05. For all calculations, degrees of freedom = 1.

It is noteworthy that while significant associations have been found in four of the six comparable sensory areas, there are many individual cases where parents and teachers did not agree in their rating of the child's sensory difficulties. For example, parents rated 40 children and teachers rated 75 children as having tactile difficulties. However, there were only 26 cases where **both** the parent and teacher rated the same child as having tactile difficulties. Hence, 14 children were rated as having tactile difficulties at home but not at school and 49 children were rated as having tactile difficulties at school but not at home. Possible reasons for these discrepancies will be discussed in the next chapter.

Although there were considerable discrepancies between parental and teacher ratings on the sensory sections, a pattern was evident when responses to individual questions were analysed. The items on which 50% or more of children were rated as 'Always' or 'Frequently' seen to display the named behaviour were examined. It is not possible quote individual items in order to comply with copyright restrictions. However, examination of the responses shows that two clear areas of concern were apparent: overactivity and difficulties with attention. These two themes were clearly evident for both parent and teacher responses.

4.4 Associations between SPDs, BESD and Background Factors

This section investigates associations between SPDs and types of BESD in cases where children have been recorded as having a background factor / difficulty. A large number of children were rated as having difficulties on some background factors, such as the parental rating for the child being anxious (n= 62), however nine background factors had an incidence of 15 or less and so the results should be treated with caution due to the relatively small number of participants involved. Analysis of the factors with a frequency of less than 15 is presented in Appendix 6. Frequency tables and p values for the analysis of background and SDQ factors with significant associations (and a frequency of more than 15) can be found in Appendix 7.

In 68 of the 70 instances where an association was found, the existence of a background factor or SDQ difficulty was related to a higher prevalence of sensory difficulties. Two associations with SDQ Sections were counterintuitive. The existence of difficulties in SDQ ‘Hyperactivity’ and SDQ ‘Conduct Difficulties’ were associated with not having difficulties on the SC Availability for Learning Section.

4.4.1 Background Factors with No Associations

No association was found between any of the 18 sensory measures and the following factors shown in Table 18.

Table 18:

Background Factors Where No Associations were Found with SDQ or Sensory Measures.

Background Factor/Difficulty	Rated by Teacher or Parent	N children rated as having the background factor or difficulty
Difficulties with learning	Teacher	95
Pro-social behaviour (measured by the SDQ)	Teacher	62
Difficulties during birth or labour	Parent	52

All the scores on the Chi-square test for these factors were non-significant.

4.4.2 Associations with SSP and SC Total Scores

Table 19 shows all the background factors where a significant association was found with The Total Score on the SSP and/or the Total Score on the SC.

Table 19:

Significant Associations Between Background Factors and 'Total Scores' on the SSP and SC

Background Factor	N	% of Total	x^2	**SSP Total (Parent)**	**SC Total (School)**
N with difficulties on SSP or SC Total				72	64
Gender	118 (boys)	82	**x^2**	0.61	3.95
			p	ns	<.05
Anxiety (Parent)	62	47	**x^2**	15.02	2.85
			p	<.001	ns
Fussy baby (Parent)	43	32	**x^2**	7.19	0.33
			p	<.01	ns
Other Diagnoses (Parent)	34	27	**x^2**	5.36	0.50
			p	<.05	ns
Assessed by an OT (Parent)	32	25	**x^2**	7.03	1.50
			p	<.01	ns
Assessed by an OT (Teacher)	15	12	**x^2**	5.78	3.98
			p	<.05	<.05

Note: ns = non-significant. Non-significant results are shaded. For all calculations, degrees of freedom = 1. Results were reported as significant if $p<.05$.

Only one background factor, 'Assessed by an OT (Teacher)' showed significant associations with the Total Score on both the parent and teacher sensory measures. Only 15 participants were rated as being in this category, hence the results should be interpreted with caution.

4.4.3 Associations with SSP Sections

Several significant associations were found between SSP Sections and background factors as is shown in Table 20.

Table 20:

Associations Between SSP Sections and Children Rated as Having Difficulties in Background Factors

Back-ground Factor	N		SSP Seeks Sensation	SSP Auditory	SSP Tactile	SSP Taste	SSP Low Energy/ Weak	SSP Move-ment	SSP Visual & Auditory
N			94	92	40	40	40	33	30
Anxiety (Parent)	62	x^2	1.24	12.64	18.06	5.15	6.43	6.79	12.08
		p	= ns	<.001	<.001	<.05	<.001	<.01	<.005
Fussy baby (Parent)	42	x^2	5.61	6.00	15.42	12.93	4.24	1.52	8.90
		p	<.05	<.05	<.001	<.001	<.05	=ns	<.005
Other difficulties (Parent)	34	x^2	0.11	1.33	4.09	0.25	10.29	7.52	1.71
		p	=ns	=ns	<.05	=ns	<.005	<.01	=ns
Assessed by an OT (Parent)	32	x^2	0.02	1.84	0.21	0.05	7.36	4.27	6.74
		p	=ns	=ns	=ns	=ns	<.01	<.05	<.01
Other difficulties (Teacher)	24	x^2	0.01	0.70	4.03	2.63	6.49	2.59	2.75
		p	=ns	=ns	<.05	=ns	<.05	=ns	=ns
Assessed by an OT (Teacher)	15	x^2	2.177	0.96	0.58	4.39	1.21	0.00	0.20
		p	=ns	=ns	=ns	<.05	=ns	=ns	=ns

Note: ns = non-significant. Non-significant results are shaded. Results were reported as significant if p<.05. For all calculations, degrees of freedom = 1.

Significant associations were found between ‘Anxiety’ (Parent) and ‘Fussy Baby’ and six of the seven SSP Section scores. For example, 50% of ‘fussy children’ were rated by parents as having tactile difficulties, compared to only 17% of ‘not fussy children’. (χ^2 = 15.420, (1), p< .001.) However, no association was evident between ‘fussy children’ and any sensory measures at school. There was only one significant association for ‘anxiety (Parent)’ on the SC.

Although parents rated that a large number of children had difficulties with 'Seeks Sensation' and 'Auditory Filtering' there were only three significant associations between these sensory scores and any of the background factors that have often been linked to SPDs in other research. By comparison, four of the other SSP Sections had links with five or six different background factors.

It is notable that the SSP Section Low energy / weak has associations with five factors, which is counterintuitive considering that such a high number of participants were rated as being hyperactive. However, this may be an indication that the activity levels of a number of participants fluctuate, as is thought to be the case with SMDs.

4.4.4 Associations with SC Sections

There were few significant associations between the SC Sections and background factors as shown in Table 21 below.

Table 21:

***Associations Between SC Sections and Children Rated as Having Difficulties in Background Factors*.**

Background Factor	N	x^2	SC Movement	SC Classroom Behaviour	SC Touch	SC Auditory	SC Visual
N			85	80	75	52	36
Anxiety (Parent)	62	**x^2**	0.00	1.36	0.82	0.51	5.78
		p	ns	ns	ns	ns	<.05
Anxiety (Teacher)	58	**x^2**	0.08	5.11	0.05	3.67	3.13
		p	ns	<.05	ns	ns	ns
Assessed by an OT (Parent)	32	**x^2**	0.36	0.15	0.65	0.42	6.06
		p	ns	ns	ns	ns	<.05
Other diagnosis (Teacher)	24	**x^2**	1.35	0.38	0.77	0.85	8.13
		p	ns	ns	ns	ns	<.005
Assessed by an OT (Teacher)	15	**x^2**	1.00	0.46	5.04	0.02	2.89
		p	ns	ns	<.05	ns	ns

Note: ns = non-significant. Non-significant results are shaded. Results were reported as significant if p<.05. For all calculations, degrees of freedom = 1.

The visual Section, which was the one rated as having the least number of children with difficulties, showed three significant associations (Anxiety (Parent), Assessed by an OT (Parent) and Other diagnosis (Teacher)). No other SC Section showed more than one.

Table 22:

Associations between SC School Factor Sections and Children Rated as Having Difficulties in Background Factors

Background Factor	N	x^2	School Companion School Factors			
			Tolerance for sensory input	Sensory seeking / Registration	Availability for learning	Attention & Awareness
N			76	75	46	23
Behaviour (Teacher)	105	x^2	1.97	5.12	1.35	0.06
		p	ns	<.05	ns	ns
Anxiety (Parent)	62	x^2	2.07	0.09	2.56	4.77
		p	ns	ns	ns	<.05
Anxiety (Teacher)	58	x^2	12.16	0.01	14.85	1.67
		p	<.001	ns	<.001	ns
Assessed by an OT (Teacher)	15	x^2	0.03	4.44	0.05	0.27
		p	ns	<.05	ns	ns

Note: ns = non-significant. Non-significant results are shaded. Results were reported as significant if p<.05. For all calculations, degrees of freedom = 1.

Like the analysis of other SC Sections and background factors there is no clear pattern of association. It is notable that there are highly significant associations between ‘Anxiety’ (Teacher) and ‘Tolerance for sensory input’ (p<.001) and ‘Availability for Learning’ (p<.001).

4.5 Associations between Sensory Measures and Subtypes of BESD

Associations were analysed between measures of sensory processing and the different types of behavioural emotional and social difficulties (measured by the

SDQ) using Pearson's chi-square test. The results are shown in Table 23 of any significant relationships that were found.

Table 23:

Analysis of Association Between Parental Sensory Data (SSP) and SDQ Categories

Short Sensory Profile Sections (Parent Rating)	N		SDQ Hyper-activity	SDQ Conduct Problems	SDQ Peer Relations	SDQ Emotional	SDQ Total
N			100	68	54	37	90
SSP Tactile	40	x^2	0.13	0.41	5.12	0.68	0.73
		p	ns	ns	<.05	ns	ns
SSP Movement	33	x^2	0.10	0.73	9.48	2.73	4.12
		p	ns	ns	<.005	ns	<.05
SSP Seeks Sensation	94	x^2	3.48	4.92	4.72	0.10	2.10
		p	ns	<.05	<.05	ns	ns
SSP Low Energy / Weak	40	x^2	0.28	1.70	0.63	4.22	2.89
		p	ns	ns	ns	<.05	ns
SSP Full Total	72	x^2	0.97	0.06	11.43	3.31	0.19
		p	ns	ns	= .001	ns	ns

Note: ns = non-significant. Non-significant results are shaded. Results were reported as significant if p<.05. For all calculations, degrees of freedom = 1.

There were few significant associations between sensory data provided by parents and the BESD measures provided by teachers, except for the SDQ measure 'Peer Relations' which has significant scores for four SSP Sections. 'Peer Relations' is also significantly associated with seven of the SC Sections as is shown in Table 24.

Table 24:

Analysis of Association Between Teacher Sensory Data (SC) and SDQ Categories

SC Section (Teacher rating)	N pupils with SPDs on the SC		SDQ Emotional	SDQ Conduct	SDQ Hyper-activity	SDQ Peer Relations	SDQ Total
N - pupils with BESD on SDQ			39	74	107	59	68
SC Movement	85	x^2	0.00	0.62	9.25	7.93	9.98
		p	ns	ns	<.005	= .005	<.005
SC Classroom Behaviours	80	x^2	5.71	7.01	0.88	7.86	6.47
		p	< .05	<.01	ns	= .005	<.05
SC Tolerance for Sensory Input	76	x^2	10.00	0.97	0.03	3.96	5.87
		p	<.005	ns	ns	<.05	<.05
SC Tactile	75	x^2	0.07	4.65	2.66	12.14	11.37
		p	ns	<.05	ns	<.001	= .001
SC Sensory Seeking & Registration	75	x^2	0.07	4.65	9.97	9.89	13.90
		p	ns	= .05	<.005	<.005	<.001
SC Auditory	52	x^2	7.292	0.06	0.29	9.41	3.39
		p	<.01	ns	ns	<.005	ns
SC Availability for Learning	46	x^2	21.547	9.543	6.391	6.757	0.589
		p	<.001	<.01	<.05	<.01	ns
SC Visual	36	x^2	3.39	0.33	2.05	1.62	5.57
		p	ns	ns	ns	ns	<.05
SC Attention & Awareness	23	x^2	0.01	5.56	2.30	0.43	0.06
		p	ns	<.05	ns	ns	ns
SC Total	64	x^2	4.57	2.94	1.75	18.99	10.11
		p	<.05	ns	ns	<.001	= .001

Note: ns = non-significant. Non-significant results are shaded. Results were reported as significant if p<.05. For all calculations, degrees of freedom = 1.

There were significant associations between a wide range of BESD Sections and Sections on the SC. The behaviour Section with the most associations with sensory difficulties is ‘Peer Relations’. There was a significant relationship between children with difficulties in peer relations and 12 of the 18 sensory measures. For example, 69.5% of children with difficulties with peer relationships were found to have difficulties with touch at school whereas, of the children without difficulties with peer relations, only 40% had tactile difficulties. Analysis indicates that this is a significant relationship (χ^2= 12.137, $p < .001$).

The largest Chi-square score was for SDQ emotional difficulties and SC Availability for learning (χ^2=21.54 $p<.001$). ‘Classroom Behaviour’, ‘Sensory Seeking / Registration’ and ‘Availability for Learning’ all had significant associations with four of the five SDQ measures.

4.6 Current Level of SENCo Knowledge about SPDs

SENCos from 45 of a total of 65 schools responded to the questions listed below. This is a response rate of 69%. The teachers who **disagreed** with the statements indicated that they have a poor understanding of knowledge about SPDs as is shown in Table 25 below.

Table 25:

Responses to SENCO Questionnaire, Relating to SENCo Knowledge about Sensory Processing Difficulties

Questions on the SENCo Questionnaire	% of SENCos that agreed or disagreed with the statement.		
I have a good understanding of the following:	**% Agree**	**% Neither**	**% Disagree**
• **sensory processing disorder (also known as sensory integrative dysfunction)**	**18**	**24**	**58**
• **sensory modulation disorder**	**7**	**9**	**84**
• **the vestibular sense**	**18**	**11**	**71**
• **the proprioceptive sense**	**18**	**9**	**73**
• **tactile defensiveness**	**18**	**18**	**64**
	% Agree	**% Neither**	**% Disagree**
• **I am confident I can identify behaviour that might have a sensory cause.**	**29**	**33**	**38**
• **I am familiar with strategies and resources to support children with sensory processing difficulties**	**18**	**31**	**51**
• **I know where to find strategies and resources to support children with sensory processing difficulties**	**36**	**20**	**44**
• **Teachers and TAs in my school know how to identify and support sensory processing difficulties**	**7**	**22**	**71**

The data show that a substantial number of SENCos rated themselves as **not** having a good understanding of sensory processing difficulties. Given that the data from this research indicate that 44% of children with BESD have sensory difficulties (teacher rating) the SENCo data suggest a need for improving the understanding of SPDs in schools so that BESD children are appropriately supported.

4.7 Summary of Results

The results show that 82% of the participants (n = 144) were boys and 18 of those attended a special school for children with BESD. Parents rated on the SSP Total score that 55% of the sample had sensory difficulties, whereas teachers rated on the SC that 44% of the sample had sensory difficulties on the SC Total Score. The percentage of children found to have difficulties on the SSP Sections varied from 23% to 70% with the greatest level of difficulties being found for ‘Auditory Filtering’ (69%) and ‘Seeks Sensation’ (70%). The percentage of children found to have difficulties on the SC varied from 25% for ‘Visual’ to 59% for ‘Movement’. Significant associations between parent and teacher response on the sensory measures were only found on four of the six comparable sections.

An overview of the results for the whole sample and for the mainstream and special school samples is provided below in Table 26 and Table 27.

Table 26:

Overview of Main Results for the Whole Sample

SDQ: Strengths and Difficulties Questionnaire (Teacher measure of BESD)
SSP: Short Sensory Profile (Parental sensory measure)
SC: Sensory Profile, School Companion (Teacher sensory measure)

SDQ, SSP & SC Sections	Numbers of Children in Each Category				% of children with Probable or Definite Difficulties
	N Total	Typical	Probable Difficulties	Definite Difficulties	
SDQ Emotional	144	91(63 %)	14 (10%)	39 (27%)	37%
SDQ Conduct	144	56 (39%)	14 (10%)	74 (51%)	61%
SDQ Hyperactive	144	27 (19%)	10 (7%)	107 (74%)	81%
SDQ Peer Relations	144	70 (49%)	15 (10%)	59 (41%)	51%
SDQ Pro-social	144	47 (33%)	29 (20%)	68 (47%)	67%
SDQ Total	144	10 (7%)	37 (26%)	97 (67%)	93%
SSP Tactile	134	60 (45%)	34 (25%)	40 (30%)	55%
SSP Taste	134	87 (65%)	7 (5%)	40 (30%)	35%
SSP Movement	135	88 (65%)	14 (10%)	33 (24%)	35%
SSP Seeks Sensation	135	19 (14%)	22 (16%)	94 (70%)	86%
SSP Auditory	133	18 (14%)	23 (17%)	92 (69%)	86%
SSP Low Energy	133	80 (60%)	13 (10%)	40 (30%)	40%
SSP Visual / Auditory	133	79 (59%)	24 (18%)	30 (23%)	41%
SSP Total Score	131	41 (31%)	18 (14%)	72 (55%)	69%
SC Auditory	144	36 (25%)	56 (39%)	52 (36%)	75%
SC Visual	144	52 (36%)	56 (39%)	36 (25%)	64%
SC Movement	144	27 (19%)	32 (22%)	85 (59%)	81%
SC Touch	144	32 (22%)	37 (26%)	75 (52%)	78%
SC Sensory Behaviour	144	25 (17%)	39 (27%)	80 (56%)	83%
SC Total Score	144	23 (16%)	57 (39%)	64 (44%)	83%
SC Sensory Seeking & Registration	144	30 (21%)	39 (27%)	75 (52%)	79%
SC Attention & Awareness	144	63 (44%)	58 (40%)	23 (16%)	56%
SC Tolerance for Sensory Input	144	30 (21%)	38 (26%)	76 (53%)	79%
SC Availability for Learning	144	61 (42%)	37 (26%)	46 (32%)	58%

Table 27:
Overview of Main Results for Mainstream Schools and the BESD Special School

SDQ, SSP & SC Sections	Mainstream Schools: Numbers of Children in Each Category				Special BESD School: Numbers of Children in Each Category			
	N Total	Typical	Probable Difficulty	Definite Difficulty	N Total	Typical	Probable Difficulty	Definite Difficulty
SDQ Emotional	126	81 (64%)	12 (10%)	33 (26%)	18	10 (56%)	2 (1%)	6 (33%)
SDQ Conduct	126	49 (39%)	10 (8%)	67 (53%)	18	7 (39%)	4 (22%)	7 (39%)
SDQ Hyperactive	126	21 (17%)	9 (7%)	96 (76%)	18	6 (33%)	1 (6%)	11 (61%)
SDQ Peer Relations	126	66 (52%)	13 (10%)	47 (37%)	18	4 (22%)	2 (11%)	12 (67%)
SDQ Pro-social	126	40 (32%)	27 (21%)	59 (47%)	18	7 (39%)	2 (11%)	9 (50%)
SDQ Total	126	9 (7%)	33 (26%)	84 (67%)	18	1 (6%)	4 (22%)	13 (72%)
SSP Tactile	116	57 (49%)	28 (24%)	31 (27%)	18	3 (17%)	6 (33%)	9 (50%)
SSP Taste	116	79 (68%)	7 (6%)	30 (26%)	18	8 (44%)	0 (0%)	10 (56%)
SSP Movement	117	79 (68%)	10 (9%)	28 (24%)	18	9 (50%)	4 (22%)	5 (28%)
SSP Seeks Sensation	117	18 (15%)	20 (17%)	79 (68%)	18	1 (6%)	2 (11%)	15 (83%)
SSP Auditory	115	17 (15%)	20 (17%)	78 (68%)	18	1 (6%)	3 (17%)	14 (78)
SSP Low Energy	115	71 (62%)	11 (10%)	33 (29%)	18	9 (50%)	2 (11%)	7 (39%)
SSP Visual / Auditory	115	73 (63%)	21 (18%)	21 (18%)	18	6 (33%)	3 (17%)	9 (50%)
SSP Total Score	113	38 (34%)	16 (14%)	59 (52%)	18	3 (17%)	2 (11%)	13 (72%)
SC Auditory	126	31 (25%)	51(40%)	44 (35%)	18	5 (28%)	5 (28%)	8 (44%)
SC Visual	126	44 (35%)	52 (41%)	30 (24%)	18	8 (44%)	4 (22%)	6 (33%)
SC Movement	126	23 (18%)	27(21%)	76 (60%)	18	4 (22%)	5 (28%)	9 (50%)
SC Touch	126	29 (23%)	33 (26%)	64 (51%)	18	3 (17%)	4 (22%)	11 (61%)
SC Sensory Behaviour	126	25 (20%)	35 (28%)	66 (52%)	18	0 (0%)	4 (22%)	14 (68%)
SC Total Score	126	21 (17%)	52 (41%)	53 (42%)	18	2 (11%)	5 (27%)	11 (61%)
SC Sensory Seeking & Registration	126	27 (21%)	32 (25%)	67 (53%)	18	3 (17%)	7 (39%)	8 (44%)
SC Attention & Awareness	126	56 (44%)	50 (40%)	20 (16%)	18	7 (39%)	8 (44%)	3 (17%)
SC Tolerance for Sensory Input	126	30 (24%)	32 (25%)	64 (51%)	18	0 (0%)	6 (33%)	12 (67%)
SC Availability for Learning	126	56 (44%)	29 (23%)	41 (33%)	18	5 (28%)	8 (44%)	5 (28%)

Chapter 5

Discussion

5.1 Issues of Terminology that Affect the Results

Before discussing specific areas of the results it is important that general issues which relate to the interpretation of the results are highlighted and the terms used to discuss sensory difficulties are clarified.

5.1.1 Distinction between Sensory Processing Disorder and Sensory Processing Difficulties.

Within the field of occupational therapy there is a prominent school of thought that suggests that some children can be clearly identified as having a sensory processing disorder either as part of or, in some cases, independently of any other diagnoses (Miller, 2007). Outside the field of occupational therapy the identification of sensory processing disorder as a stand alone diagnosis remains controversial (Pollock, 2009). It is proposed that educational psychologists are unlikely to be routinely instrumental in diagnosing children with a sensory processing disorder, and so debates surrounding the existence of sensory processing disorder as an independent diagnosis and the efficacy of sensory integration therapy are not the focus of this study.

However, there is evidence to show that certain children experience difficulties in the way that they process sensory information compared to typical children for example, Parush et al., 2007; McIntosh et al., 1999; Davies & Gavin, 2007; Tomchek & Dunn, 2007; Baranek, 2002; Ermer & Dunn, 1998; Dawson & Watling, 2000; Watling, Deitz & White, 2001; Franklin et al., 2008; Mangeot et al. 2001; Rogers et al., 2003; Ahn et al., 2004; and Ben-Sasson et al., 2009. In addition sensory difficulties are so well recognised in relation to Autistic Spectrum Disorders (e.g. Tomchek & Dunn, 2007; Branek, 2002; Ermer & Dunn, 1998; Dawson & Watling, 2000; and Watling, Deitz & White, 2001) that sensory sensitivities were included as a diagnostic feature of ASD in the draft version of DSM V. The draft version has now been withdrawn prior to DSM V being published in May 2013.

This study has attempted to add to the presently limited evidence base relating to sensory processing difficulties and to raise awareness of sensory issues within the field of educational psychology where they have been neglected in peer reviewed literature. In addition the intention has been to move beyond the known links between sensory processing difficulties and diagnoses such as ASD to see whether an awareness of sensory processing difficulties may be relevant when supporting certain children with BESD. This research has focused on sensory issues that were observed in BESD children at the time of data collection. No attempt has been made to formally label any children with sensory processing disorder on the basis of data collected in this study.

The distinction between the terms sensory processing disorder and sensory processing difficulties is critical to this research for a number of reasons as follows. The existence of sensory processing disorder as a discrete diagnosis remains controversial (Pollock, 2009), whereas observations that a proportion of children experience sensory difficulties is increasingly well documented (for example Parush et al., 2007; McIntosh et al., 1999; Davies & Gavin, 2007; Tomchek & Dunn, 2007; Baranek, 2002; Ermer & Dunn, 1998; Dawson & Watling, 2000; Watling, Deitz & White, 2001; Franklin et al., 2008; Mangeot et al. 2001; Rogers et al., 2003; Ahn et al., 2004; and Ben-Sasson et al., 2009) Sensory processing disorder is usually identified by occupational therapists with specialist training in sensory integration (Dunn, 1999; Kinnealey & Miller, 1993) and training in the use of assessments such as the Sensory Integration and Praxis Test. According to Miller (2007) the overarching term sensory processing disorder includes sensory based motor disorders. It is suggested that detailed assessment and diagnosis of motor disorders and sensory processing disorders are usually beyond the expertise of educational psychologists. As stated by Dunn (2006),

> '*Occupational therapists have expertise in sensory processing as part of their professional preparation. Other professionals such as speech-language pathologists, psychologists, or educators can acquire this expertise through post-professional education'* (p4).

The researcher undertook additional training in order to have the necessary expertise to interpret the results of the sensory measures in this study. Hence, it is proposed that with training and through the use of structured screening questionnaires (such as the Sensory Profile or the Sensory Processing Measure) it is possible for educational psychologists to develop awareness that there may be a sensory basis to some children's behaviour and to identify that a child may be displaying some sensory difficulties. In particular, difficulties in sensory modulation (where children find it hard to regulate their levels of alertness and their responses to sensations) might be considered of particular interest to psychologists. This is due to the suggested links between sensory and emotional regulation, which may affect children's behaviour, attention and social skills (Bhreathnach, 2008; Ben-Sasson, et al. 2009). Hence, the focus of this study has been on sensory modulation rather than more physical difficulties such as sensory motor problems. If a psychologist were to find that a child's sensory difficulties were significant and interfering with the child's daily functioning, then it is suggested that an outcome of the educational psychologist's involvement might be to engage the occupational therapy service for further support and assessment.

The term sensory processing disorder is also deliberately not used to discuss the data collected in this study, because it implies that the child has a life long, within child deficiency, which may be the case for some children. However, it does not take into account the many environmental factors that may impact on the way that children respond to sensory stimuli. It has been found that BESD is affected by a range of environmental factors (Jull, 2008; Rush & Harrison, 2008; Meltzer et al., 2000). It is tentatively proposed that it is possible for some children to have acquired temporary sensory difficulties. For example, a child in a heightened state of anxiety due to emotional distress, may display lack of tolerance for sensory input and be easily overwhelmed in highly stimulating environments. It is suggested that in such situations, labelling the child with a sensory processing disorder would not be helpful, but recognising that he/she is experiencing some difficulties tolerating particular sensory inputs due to high anxiety, may help teachers to make the child's environment more tolerable until his/her emotional issues have resolved.

Another reason why a clear distinction between sensory processing disorder and sensory processing difficulties has been made is due to the use of screening questionnaires such as the Short Sensory Profile in research investigating sensory processing disorder. A number of research studies have exclusively used the short sensory profile as a measure of sensory processing disorder. It seems bold to use data generated by a screening questionnaire as evidence of sensory processing disorders and so throughout this study, research that relies on screening questionnaires for diagnosis is more cautiously discussed as providing evidence of sensory processing difficulties rather than evidence of a formal diagnosis. However, due to evidence supporting the construct validity of the Short Sensory Profile (Dunn, 1999; Davies & Gavin, 2007) it seems reasonable to suggest that the Short Sensory Profile is a useful tool in identifying children who have been rated as having sensory difficulties compared with typical children. Please see sections 3.1.3a and 5.4.3 for further information.

5.2 Demographics

5.2.1 Gender

It is immediately striking that 82% of the participants were boys, which is a clear indication that teachers consider many more boys to have BESD than girls. It has been suggested that boys display more externalising behaviours whereas girls are more prone to internalising behaviours (Layard & Dunn, 2009; Rothon et al., 2010) which are less apparent in the classroom. The behaviours displayed by many boys (e.g. aggression, defiance, overactivity) are very troublesome to teachers, disruptive to the class and hence immediately obvious. Therefore, it is possible that BESD in girls is underreported due to boys' difficulties being much more apparent. This may explain why only 27% of the sample was rated as having 'Emotional Difficulties' whereas 51% were rated as having 'Conduct Difficulties' and 74% as having 'Hyperactivity'; both of which tend to disrupt classes with the result that such difficulties are immediately evident to teachers.

Although there was no significant difference between SPDs for boys and girls on the parental rating, teachers rated that boys (48%) were significantly more likely to have SPDs than girls (27%). These figures may indicate that SPDs are more prevalent in boys compared to girls in this sample. Alternatively, incidence of SPDs may be similar as indicated by parental reports, but teachers have tended to focus more on the disruptive behaviours that are seen more commonly in boys.

On the other hand, it should be considered that the education system may provide particular challenges for a significant number of boys, who find it difficult to manage their behaviour in school. For example, several studies have found that many children are not engaging in the minimum recommended requirement for physical activity in school (e.g. Cardon & De Bourdeaudhuij, 2008; Tucker, 2008; Metcalf et al., 2008 and Nettlefold, 2011). Although physical activity levels for children have been found to be low, boys have been found to be more active than girls (e.g. Nettlefold et al., 2011; Rothon et al., 2010, Lopes et al., 2011 & Metcalf et al., 2008). Perhaps girls are better at coping in a society with fewer physical demands as suggested by Metcalf et al. (2008). Children have been found to spend up to 85% of their day engaged in sedentary activities (Cardon & De Bourdeaudhuij, 2008) and it is possible that some boys find it difficult to manage their behaviour in such sedentary conditions. There is some evidence to show that increased levels of physical activity is associated with a reduction in mental health issues (Rothon et al., 2010 and Lopes et al., 2011) and with improved behaviour and academic achievement (Trudeau & Shepherd, 2008) which suggests that an awareness of children's physiological needs may be relevant when supporting BESD in schools.

Due to the predominance of boys in this sample it has been decided to refer to children as 'he' rather than 'he/she' for ease of reading in this discussion.

5.2.2 Age

Considering that this study involved relatively small numbers of participants it is possible that the differences in numbers of children nominated from each year group occurred by chance; however a possible pattern is discernible. It may be that few children were nominated in Reception because teachers felt that they did not know the children well enough to judge whether they had persistent BESD or whether they just needed time to adjust to school education. However, by Year 1 schools may be more likely to have identified which individuals demonstrated more persistent difficulties. In addition the curriculum becomes more formal and many children who had coped with the high level of play activities in Reception may find it more difficult to conform with the more formal teaching style frequently adopted in Year 1. This may account for the high levels of referrals (n= 29) in Year 1. Referrals for BESD were steady for Years 2, 3 and 4 but increased in Year 5 (n= 34). Only 12 children in year 6 were included in the research but this was due to the age restrictions of the SSP, which meant that any Year 6 pupils who had turned 11 years were not eligible to take part. SENCos repeatedly requested that 11 year old pupils be included in the research; indicating that, if they could have participated, there would have probably been a bulge of referrals in Year 5 & 6. This may reflect a trend towards certain behavioural difficulties becoming more entrenched and more prevalent as children move towards adolescence as found by Beaman et al. (2007).

Research has found that the ability to respond appropriately to sensory stimuli in typical children seems to improve with age (Davies & Gavin, 2007). However, this was not found to be the case for children with SPDs. Similar results were found in this study, in that the prevalence of SPDs was not found to be lower in older children.

5.2.3 Socioeconomic Status

The results show that participants were drawn from a variety of schools with 29% attending the most affluent schools and 27% attending the most deprived. However, no data were collected about the socioeconomic status of each child because recruiting parents to the study was a sensitive task and it was felt that questions about a family's financial situation may have deterred parental participation. As a result, it is not possible to know whether the sample was representative of 'typical' BESD children. There is considerable evidence that BESD is associated with low socioeconomic status (Washbrook & Waldfogel, 2011; Griggs & Walker, 2008; Goodman & Greg, 2010). Hence, it is reasonable to assume that a significant proportion of children in this study were from lower income groups. This assumption is supported by the fact that in the special school for BESD, 86% of the children were eligible for free school meals. This suggests that it is likely that many of the participants are from low income households. SPDs have been associated with severe deprivation (Cermak & Daunhauer, 1997; and Fries et al., 2005). Ben-Sasson et al. (2009) present several suggestions for why SOR may be more prevalent in children from low income households,

> *'One possibility is that a low socioeconomic environment may consist of cluttered, intense and uncontrolled input (e.g. more people in a smaller space, loud noises), thus a child with a predisposition for SOR may be more challenged by such an environment. Another possibility is that the impact of the environment on the presentation of SOR occurs prenatally…It is also possible that parents of lower SES [socioeconomic status] report more sensations that bother their child due to their own elevated stress'* (p 714).

Ben-Sasson et al. (2009) suggest that mothers from low income families are more likely to experience stress in pregnancy, abuse alcohol / drugs and experience violence than other mothers, which may in turn affect the sensory processing of the baby.

5.3 Prevalence Shown by the Total SSP & SC Scores

Limitations with the sample have been noted in Chapter 3, as has the use of a screening questionnaire to identify SPDs rather than detailed assessment by an occupational therapist. In addition the total score for the SC has been created for this study through summing the scores of the individual sections. The Total Score for the SC was not tested for reliability and validity during the development of the SC and so the results referring to the Total SC Score should be treated with caution. The results of the Total Scores on the SSP and SC show that parents rated that 55% of BESD children had sensory difficulties and schools rated that 44% showed sensory difficulties in school. On initial examination, it appears that these results clearly indicate that SPDs are relevant to approximately half the children in this BESD sample. In addition teachers rated that another 39% of the sample had ‘probable’ SPDs, hence 83% of the sample were rated as having SPDs or probable SPDs by teachers. These results suggest that it may be important for school staff to be aware of the potential sensory source of some behaviour in schools. It is acknowledged that for many pupils with BESDs sensory issues may not be relevant, but it is proposed that routine screening or assessment for sensory issues may be beneficial when planning interventions for BESD children. Considering the number of participants who have been rated as having sensory difficulties in this study, in addition to evidence demonstrating sensory difficulties for children with diagnoses such as ASD (eg. Tomchek & Dunn, 2007; Dawson & Watling, 2000 and Baranek, 2002) and Foetal Alcohol Syndrome (Franklin et al., 2008), it is also reasonable to suggest that it may be helpful to raise awareness of sensory processing among teachers. This is emphasised by the responses to the SENCo questionnaire, where 71% of SENCos felt that teachers and teaching assistants did not know how to identify and support sensory processing difficulties.

5.3.1 SPDs Prevalence for BESD Children Compared with Previous Research

The results for prevalence of SPDs among pupils with BESD are significantly higher than has been found within the general population. There is a low prevalence for children who have been screened for other developmental difficulties as shown by Tomchek & Dunn (2007) where only 3.2% of children were found to have a ‘definite difference’ on the SSP. Similarly, Ahn et al. (2004) found that from 5-13% of children entering school had SPDs and Ben-Sasson et al. (2009) found that a slightly higher level of 16% of children experienced SOR. The parental score on the SSP in this study shows that 55% of BESD pupils were rated as having SPDs, which is considerably higher than has been found in the general population.

The rate of SPDs in this BESD sample is lower than has been found for children with clinical diagnoses. For example, the following percentages of children have been found to have SPD: 86% of ASD pupils (Tomchek & Dunn, 2007); 73% with Fragile X Syndrome (Baranek et al., 2002); 73% of children with Foetal Alcohol Syndrome (Franklin et al., 2008); and 69% of ADHD children were found to have tactile defensiveness (Parush et al., 2007). It is probable that SPDs are particularly associated with the diagnoses listed above. A few children in the current study had other diagnoses, but the numbers were small. For example 9-10 participants had an ASD diagnosis; 8-9 had an ADHD diagnosis and 4 children had a diagnosis of DCD. Hence, the majority of the participants did not have diagnoses that are commonly associated with SPDs. This indicates that this research may have identified a sizable group of pupils with possible sensory difficulties that has until now been largely overlooked. It is likely that several participants had developmental difficulties that were undiagnosed at the time of data collection. Indeed seven participants indicated that the child was thought to be on the autistic spectrum, but was awaiting diagnosis. This is predictable as the local authority had long waiting lists for formal assessment of ASD.

The data indicate that SPDs may be impacting on the behaviour of approximately half the children in this study. It is possible that some children have been identified as having BESD due to their sensory needs, which makes it difficult for the child to attend, sit still and tolerate the school environment. Alternatively, some children may have significant emotional, social or conduct difficulties which have led to them developing unusual ways of responding to the world. It is not possible to predict causality from these data, although a number of studies have reported behavioural difficulties in children with SPDs (e.g. Ben-Sasson et al., 2009; Barnhart et al., 2003; and Franklin et al., 2008). Equally there is evidence that children who have suffered trauma and severe emotional neglect may develop SPDs (Cermak & Daunhauer, 1997; and Fries et al, 2005).

5.4 The Pattern of Difficulties on the SSP and SC Sections

5.4.1 SSP Section Comparison

While the total scores for the SSP and the SC seem to present a clear picture of the situation, it should be noted that the Total Scores include information taken from a number of different sensory Sections. The number of participants rated as having difficulties in each area varied significantly. Parents rated that between 24-30% of children had difficulties in five of the seven SSP Sections. However, 69% of children were rated as having difficulties with ‘Auditory Filtering’ and 70% as having difficulties with ‘Seeks Sensation’. Analysis of the responses to individual questions on these two sections indicates common themes of poor attention skills, high activity levels and children who are prone to distractions. Very similar themes were found when teacher responses to individual questions were analysed. This high level of parental ratings for difficulties with attention and overactivity may reflect parents’ feelings that their children do not listen to them or do as they are told. This may be an accurate observation of their children’s behaviour or their views may be influenced by the common perception that children’s current behaviour is worse than it used to be (Steer, 2009).

Similar patterns of difficulty were found using the SSP by Ashburner, Ziviani & Rodger (2008) who investigated SPDs and educational outcomes for ASD children. The authors concluded that children who had difficulties with auditory filtering and sensory seeking were more likely to underachieve academically. These sensory difficulties were commonly observed in the BESD sample. Hence, it would be interesting to extend the current research to investigate whether BESD children with these difficulties are also observed to underachieve at school.

Mangeot et al. (2001) reported some relevant correlations when investigating sensory modulation difficulties in ADHD children. It was found that aggressive behaviour was highly correlated with children who had difficulties on the ‘Seeks Sensation’ and ‘Tactile’ Sections on the SSP. The ‘Seeks Sensation’ subtest was also found to highly correlate with measures of delinquent behaviour. The results of this study also showed a significant relationship between ‘Conduct Problems’ on the SDQ and ‘Seeks Sensations’ on the SSP. This is persuasive evidence that difficulties with sensory seeking are a common difficulty among BESD children in this study and that these children's sensory needs should be considered when supporting their behaviour in school. Mangeot et al. (2001) state:

> *'As there are numerous behavioural similarities between symptoms of ADHD and SMD, we hypothesized that a subgroup of children with ADHD has a disabling sensitivity to sensory stimuli, not previously discussed in the literature. This finding could have implications for treatment of such a subgroup of children with ADHD'* (p 403).

For educational professionals who may have reservations about the medication of children viewed as being hyperactive in school, sensory strategies may present a promising alternative.

5.4.2 SC Section Comparison

Like the SSP, similar variety was found between different Sections on the SC. For example only 25% of children were rated as having visual difficulties whereas over 50% were rated as having difficulties with touch, movement and sensory behaviour. On the School Factors over 50% of children were rated as having difficulties with sensory seeking and with tolerating sensory input, whereas only 16% had difficulties with attention and awareness. These results indicate that a large number of children have been rated as 'frequently' or 'always' displaying certain behaviours on the sensory profile measures. However it is possible that some of the difficulties recorded on the sensory profiles reflect the behavioural difficulties that the child is having rather than being the result of a sensory cause. For example, 56% of children were rated as having difficulties with the 'Classroom Behaviors' Section on the SC. Teachers' responses on the SC indicated that some of the most common difficulties included inefficiency, frustration, lack of cooperation, inflexibility and problems coping with changes in routine. Such observations would be commonplace for some BESD pupils, which raises the question whether the SC 'Classroom Behaviors' section is effectively measuring SPDs or whether children were rated as having sensory difficulties due to certain questions that relate to their BESD. Of course it could be argued that the observed behaviours in many of these children are the result of sensory needs. Alternatively behaviours such as fidgeting, stubbornness and frustration may stem from a number of other causes such as boredom emotional distress, lack of respect for authority or poor motivation.

5.4.3 Examination of the Construct Validity of the SSP & SC in light of observed similarities between behaviours associated with SPDs and BESD.

As mentioned above there may be considerable overlap between behaviours that stem from sensory difficulties and behaviours commonly seen in BESD children who do not necessarily have sensory difficulties. Hence, one has to ask whether the SSP and SC are actually measuring a distinct difficulty or simply describing behaviours common in children with BESD.

The title of the SC ‘Classroom Behaviors’ section could give rise to an assumption that there is considerable overlap between this section and the SDQ, the measure for BESD in this study. However, there is only one item on the SDQ Conduct scale that has similar content to an item on the SC behaviour scale. No SSP or SC items overlap with the content of the SDQ Emotional, Peer Problems or Pro-Social scales. The only area of commonality is found on the SDQ hyperactivity scale where one question has similar content to an SC item and one question has similar content to a question contained in both the SC and SSP. Hence, examination of the individual statements included in the SDQ, SC and SSP indicates only a small overlap in the content of the BESD and sensory measures. This adds weight to the suggestion that it is unlikely that the sensory measures are simply providing a measure of BESD. Although there is considerable overlap between behaviours seen in BESD children and those with SPDs, the SSP and SC focus on examining ‘direct sensory events’ (Dunn, 1999, p 59) rather than reporting behaviour that may be a consequence of SPDs or indeed may have a number of other causes.

The SSP is reported to have excellent reliability and validity (Ahn et al., 2004), which indicates that it’s scores are consistent and that there is evidence that the questionnaire measures the constructs that it purports to measure. Of particular relevance to this study is the fact that, during the development of the SSP, all the items relating to social and emotional behaviours were removed in order to ensure that the SSP reported on ‘direct sensory events’ (Dunn, 1999, p 59) rather than on behaviours that are a product of sensory modulation difficulties. Hence, in the current study 55% of parents rated their children had difficulties on the SSP, despite the fact that the questionnaire does not include any questions relating directly to social and emotional behaviours. This indicates that it is unlikely that the SSP is simply measuring behaviours associated with BESD.

Indeed, if the SSP and SC simply provided a measure of BESD it would be expected that nearly all the children rated as having difficulties on the SDQ would also be rated as having difficulties on the SC and SSP. However, this has not been the case as, of the children who were rated as having total difficulties on the SDQ, only 50% were rated as having difficulties on the SSP and 53% were rated as having difficulties on the SC. This implies that there may be two distinct groups within this BESD sample, those with and those without SPDs. This is in line with other research findings. For example, Parush et al. (2007) found that 69% of a sample of boys with ADHD also met the criteria for tactile defensiveness, which is a sub category of sensory modulation difficulties. The tactile defensive children were distinguishable from both the control group and the ADHD children (who were not tactile defensive) by higher central somatosensory evoked potential amplitudes, which is a direct measure of the child's physiological reaction to small electrical stimuli. Hence, Parush et al.'s findings suggest that a large percentage of children with ADHD may have sensory issues. In addition, Parush et al. (2007) demonstrated that abnormal sensory responses are evident and can be directly measured in children who have been identified as having sensory modulation difficulties through rating scales and individual assessment.

Similar results were found by Mangeot et al. (2001) who found that children with ADHD displayed larger abnormalities in sensory modulation than controls both on the SSP and on measures of electrodermal reactivity, indicating that the SSP is effective in identifying sensory difficulties that are evident through direct measurement of the child's sensory responses. Like Parush et al. (2007), Mangeot et al. (2001) found considerable variability in the sensory processing of children in the ADHD group leading them to hypothesise that within the ADHD population two distinct subgroups exist, those with sensory modulation difficulties and those without '*This suggests that a group of children with ADHD may have normal physiological reactions and behavioural responses to sensory stimuli, whereas another group may be hyperreactive and overresponsive*' (Mangeot et al., 2001, p 404). The current study tentatively supports the hypothesis that within the BESD population there may be two distinct groups of children; those with SPDs and those without. If this is the case, an understanding of SPDs would be valuable in ensuring appropriate strategies are implemented to remediate the difficulties that the child is experiencing at school.

It has been found that children who have been identified as having SPDs through OT assessment can be effectively distinguished from children without SPDs through directly measuring their physical responses to sensory stimuli (Parush et al., 2007; McIntosh et al., 1999; Miller et al., 1999; and Davies & Gavin, 2007). Dunn reports that it has been found that children who are found to have abnormal EDR measurements scored significantly lower on the SSP which is strong evidence for the construct validity of the SSP, i.e. that it actually measures the underlying construct that it claims to measure. Dunn (1999) also found that the SSP could effectively discriminate between typical children and those identified as having sensory modulation difficulties through OT assessment, as children with sensory modulation difficulties had significantly lower mean scores on all sections. This supports the argument that the SSP does provide an effective measure of SPDs and is not simply measuring behavioural difficulties. Unfortunately to date, no study has examined the SC to establish a correlation between abnormal EDR measurements and low scores on the SC.

Hence although it is acknowledged that the SSP and SC are imperfect measures of SPDs, there is evidence that difficulties observed on the SSP are also evident through direct measurement of children's sensory responses to stimuli. This suggests that the SSP is effective in identifying sensory difficulties and is not just describing behaviours common in BESD children.

5.4.4 Comparison of Patterns of Difficulties for BESD and ASD children on the SSP

The data provided by the SSP on this study show a pattern of very similar difficulties with the group of 281 ASD pupils assessed on the SSP by Tomchek & Dunn (2007). The areas with the greatest reported difficulties were 'Seeks Sensation' followed by 'Auditory Filtering' for both the BESD pupils and ASD pupils in Tomchek & Dunn's study. Likewise on both studies, the greatest number of children was reported to have difficulties in the same three areas; overactivity, attention and listening skills. The table below shows that there are some differences between the two samples, for example more ASD pupils are rated as having a higher level of difficulties on five of the Sections and 84% are rated as having total difficulties compared with only 55% of the BESD population.

Table 28:

Percentage of BESD pupils with difficulties on the SSP in this study compared to ASD pupils in Tomchek & Dunn's study (2007).

SSP Sections	% of BESD pupils with difficulties (This study)	% of ASD pupils with difficulties (Tomcheck & Dunn)
Visual / Auditory Sensitivity	23%	44%
Movement Sensitivity	24%	23%
Taste / Smell Sensitivity	30%	54%
Low Energy / Weak	30%	23%
Tactile Sensitivity	30%	61%
Auditory Filtering (Listening Skills)	69%	78%
Seeks Sensation	70%	86%
Short Sensory Profile **Total Score**	55%	84%

Hence although the data indicate that in general ASD pupils have more severe sensory needs than BESD pupils, the most prevalent themes for both ASD & BESD pupils are difficulties with attention, poor listening skills and overactivity.

5.5 Overactivity and Difficulties with Listening Skills

One thing that is clear from the results of this research is that the most common BESD recorded in this sample was hyperactivity and large numbers of children were observed on the sensory profile to have difficulties with overactivity and attention problems. These difficulties were recurrent themes reported by Washbrook & Waldfogel (2011) in a recent survey of school readiness, which concluded that increasing numbers of infants are joining schools without the underlying attention and concentration skills to enable effective learning.

5.5.1 Overactivity

A key concern rated by parents and teachers in this study is a high rate of overactivity in BESD children. Overactivity is the most common behaviour difficulty recorded on the SDQ for participants in this sample. 107 pupils were rated as having difficulties with hyperactivity, although teachers recorded that only eight of those pupils had an ADHD diagnosis. Concerns about hyperactivity in children have flourished in recent decades as can be seen by the regular diagnosis of ADHD and prescription of stimulant medication (Breggin, 2002). However, it is interesting to note that overactivity is rated as being the most common difficulty on the SDQ in this sample, whereas Meltzer et al.'s survey (2000), reported that only 1% of children in the general population had hyperkinesis, whereas conduct and emotional difficulties were found to be more prevalent. This possibly suggests that either teachers particularly focus on over activity in the classroom, or perhaps there is something specific about the school environment that creates overactivity in some pupils.

It is possible that overactivity is a within-child problem that needs to be treated, but there are several other possible explanations, such as high anxiety levels causing restlessness. In this study 47 of the 107 children that were rated as being hyperactive were also rated by teachers as being generally anxious. Associations between SPDs and anxiety are discussed in section 5.7.2.

Some children may be rated as being hyperactive in school simply because their current lifestyle does not meet their physiological requirements as energetic young people. For example, as already discussed, many children are not receiving the daily recommended amounts of physical activity (Cardon & De Bourdeaudhuij, 2008; Tucker, 2008; Metcalf et al., 2008 and Nettlefold, 2011). Hence, difficulties with attention and overactivity may be partly a result of living in a technological age (Palmer, 2006), in which children are rarely required to take any exercise for daily survival needs and choose to spend a large percentage of their spare time (on average in one sample 85%) enjoying sedentary pastimes (Cardon & De Bourdeaudhuij, 2008). In addition, Bundy et al. (2009) suggest that in the current climate of litigation and health and safety regulations, teachers have become risk adverse and as a result children's physical activities may lack challenge, which may be contributing to the low levels of moderate to vigorous physical activity observed for example by Nettlefold et al. (2011) during P.E. and playtime. McLaren et al.

(2011) indicate that low levels of physical activity are a cause for concern because movement is important for optimal cognitive and communicative development. Raine et al. (2002) found that children who sought out high levels of stimulation at 3 years old showed increased academic performance at 11 years old. If children are not routinely engaging in challenging physical activity each day, it is perhaps unsurprising that some individuals are restless and perceived to be hyperactive when required to sit and attend in class. Lack of challenging physical activities also suggests reduced sensory experiences and hence limited opportunities to develop sensory integration, motor coordination and the ability to learn to regulate the body's levels of alertness (Dunn, 1999; Murray-Slutsky & Paris, 2005). This is particularly concerning for children with low to moderate motor coordination because Lopes et al. (2011) found that their levels of physical activity declined between the ages of 6-10 years, indicating that the opportunities for challenging physical experiences for children with moderate to poor motor coordination become even more limited at they mature. So in this cultural context, teacher and parent observations that children have difficulties with overactivity and attention are perhaps unsurprising.

It is possible that children have not become increasingly overactive, but that society's assumptions about what is typical in relation to activity levels have shifted in recent years. It has been observed in the course of this study that categories such as BESD are relative, depending on the school context and the same may be true of overactivity. Children living in cramped surroundings present considerable problems if they are very active (Ben-Sasson, 2009). A similar child living on a farm would not only have regular opportunities for outdoor play, but his parents may value high activity levels if he is needed to help with strenuous activities on the farm. Hence, it is possible that parental concerns about overactivity in this study have been emphasised because data collection took place in an urban environment with several areas of deprivation.

Yet another explanation for some children is that they may be bored by education and so their excessive movement may be a work avoidance strategy.
All these possible explanations for hyperactivity in school show that a number of within child and environmental factors may contribute to observations of hyperactivity in school. The results of this study indicate that for a proportion of children in this sample, SPDs may be one of a number of factors that contribute to the high levels of overactive behaviour.

5.5.2 Listening Skills

Parental observations about children's hyperactivity and poor listening skills could be due, for example, to poor boundary setting, irregular routines, or within-child behaviour or sensory problems. On the other hand difficulties with listening skills may be the consequence of the high levels of noise generated in urban environments by traffic, music, television and busy schools etc. (Heller, 2003). Flagg-Williams et al. (2011) propose that children find it particularly difficult to attend in noisy environments because their language systems are immature and hence they have more difficulty filling in the gaps in their understanding when part of an utterance has not been clearly heard.

Wright et al., (2001) comment on the detrimental effect of television if children are regularly exposed to programmes that are intended for adults. Such programmes are unlikely to hold the interest of a young child, but may present considerable background noise which may affect the child's ability to attend to other activities (Wright et al., 2001). It is also proposed that background noise involving language is particularly distracting (Flagg-Williams et al., 2011) and very disruptive to working memory (Gathercole & Alloway, 2009).

Flagg-Williams et al. (2011) also state that typical classrooms in the UK do not meet recommended guidelines for background noise. This means that children have to make considerable effort to accurately comprehend verbal information delivered in class. The results of the current study suggest that 36% of the sample were rated as having auditory difficulties at school and 69% were rated as having auditory difficulties at home. Some of these children may have a within child difficulty relating to the way in which they process auditory information as suggested by Dunn (1999). However, Flag-Williams et al.'s observations suggest that children may acquire problems with listening skills as a result of environmental influences. For example, children who have to habitually struggle to attend against background noise may be unable to sustain their attention and so become accustomed to 'tuning out'.

5.6 Comparison of Sensory Difficulties Reported by Parents and Teachers

If a child has significant sensory problems it is expected that difficulties would be evident in different settings (Murray-Slutsky & Paris, 2005). The results of this study do indicate an association between parental ratings and school ratings, for example there is a significant association between the Total Score on the SSP and Total Score on the SC (χ^2= 11.42 (1) p=.001) and significant associations between four of the six comparable Sections on the SSP and SC. But there are many individual cases where parents and schools have not concurred. There are a number of possible reasons for this observation. Firstly, although many of the headings on SSP and SC sections would indicate that a direct comparison could be drawn between the two data sets, parents and teachers were asked different questions. This is largely because the questionnaire was modified so as to be appropriate for the different settings, as there are activities that would be routinely observed at home but not at school and visa versa. The difference in the type of questions between the SSP and the SC is most evident on the Movement section where the SSP section focuses on vestibular sensitivity. However, the SC Movement section investigates activity levels, clumsiness and the child's participation in group games. Unsurprisingly, there is no significant association between the SSP and SC movement sections scores because they cover subtly different areas of concern. Similar issues are found on the Visual sections which have only one question in common between the two questionnaires. In addition the SSP does not have a purely visual section but instead has a measure of visual and auditory sensitivity, hence two of the five questions on the section relate to responses to auditory stimuli. Again it is unsurprising that no association was found between the SSP and SC Visual sections because different questions were asked on each questionnaire.

An alternative explanation for the discrepancy between parental and school scores for individual children is that the child may be perceived to be behaving differently in the two settings, as was proposed by Dunn (2006) when only moderate correlations were found between the SC and the Sensory Profile. The reasons for this are likely to vary for different cases, however it has been suggested (Murray-Slutsky & Paris, 2005; and Dunn, 2006) that often sensory difficulties become apparent when the child starts school due to the additional demands of the school environment. It is suggested that compared to most home environments, children in school are expected to sit and attend quietly for long periods in order to do challenging academic work. They have to work in very close proximity to a large number of other children and have little choice about what they do and when, throughout the school day. Some children cope well in a more fluid quiet home environment with few other children to encounter (Dunn, 1999). Alternatively, some families are chaotic and may live in bustling cramped accommodation where children are endlessly in competition with siblings for attention and resources. In such situations children's sensory difficulties may come to the fore at home, whereas school may present a more ordered and hence more tolerable environment for the child (Ben-Sasson et al. (2009).

As has been noted with the SDQ in this study, rating questionnaires can be highly subjective and disagreements between parents and schools may be due to different perceptions of what is acceptable or problematic behaviour, which may result in different ratings being provided for individual children. It cannot be ruled out that parents or teachers may have had an agenda when completing the questionnaires, which might have caused their responses to be an inaccurate representation of the situation. For example, participants may exaggerate the child's difficulties in the hope that they might be provided with more support in managing the child. Conversely, families may downplay a child's needs because they may feel that admitting to difficulties might reflect badly on the family.

The fact that there are numerous discrepancies between the results of individual cases on the SSP and SC reinforces the fact that assessment of a child's needs is a complex business. It has been shown that parental observations are often not in line with teacher's observations in schools. This raises questions about the robustness of data about the prevalence of SPDs for the many studies that have only used the SSP as the measure of SPD, (Ahn et al., 2004; Baranek, 2002; Baranek et al., 2002; Franklin et al., 2008; Gavin et al., 2011; Mangeot et al., 2001; Rogers et al., 2003; and Tomchek & Dunn, 2007).

A strength of the current study is that the school data add weight to the parental findings. Although the correlation between parental and school scores for individual children was far from perfect, both school and parental data show prevalent themes of concerns about listening skills, attention and overactivity for the sample as a whole. The difficulties with overactivity are clearly evident on the SDQ scores where 74% of the sample were rated a being hyperactive and 59% of pupils were also rated as having difficulties with Movement on the SC, showing that these concerns are evident both at home and school.

5.7 Associations with Background Factors

The research aimed to see if there were associations between the prevalence of SPDs and background factors that had been linked with SPDs in other research such as ASD diagnosis (e.g. Tomchek & Dunn, 2007; Baranek, 2002; Ermer & Dunn, 1998; Dawson & Watling, 2000; Watling et al., 2001), ADHD diagnosis (e.g. Mangeot et al., 2001; Schilling et al., 2003; and Parush et al., 2007) and difficulties during labour and delivery (May-Benson et al., 2009).

Only a few pupils with specific diagnoses were nominated for the research; hence, it is not possible to extrapolate meaningful conclusions about associations when data are only available for a handful of children. A significant relationship was found between parental ASD diagnosis (n=10) and six sensory measures and also between teacher ASD (n = 9) rating and 11 sensory measures (see Appendix 6). This is in line with numerous other studies which have found a high level of sensory difficulties in children with an ASD diagnosis (e.g. Crane et al., 2009; Kern et al., 2006; Kern et al., 2007; and Liss et al., 2006), but no firm conclusions can be drawn with such a small sample.

5.7.1 Parental Reports that the Child was a Fussy Baby

43 parents stated that their child was a ‘Fussy Baby’. There was a significant relationship between the ‘Fussy Baby’ rating and seven of the eight parental sensory measures; however only a few associations were evident on the SC. The associations between SDPs and reports of children being ‘fussy’ babies are important because they provide an indication that the sensory difficulties were likely to have been present since birth. Although, it is possible that parents who are currently struggling with a child’s behaviour may be prone to remembering the more negative aspects of a child’s infancy and hence these parents may be more likely to recall the child as being a fussy baby.

In cases where babies are seriously irritable, sensory processing theory suggests that the link between SPDs and attachment difficulties may occur due to two possible scenarios. In the first case, children who are born with SPDs may find physical sensations provided by caregivers distressing and hence become upset when handled. This in turn is disturbing for parents who may feel inadequate and start to withdraw from the child. As a consequence, the parents and infant may not form a secure bond (Bhreathnach, 2008). In such a scenario the child's sensory difficulties are exacerbated by the child's dislike of sensory stimuli which leads him to seek less engagement in the world and hence reduces the sensory and social opportunities available to him (Murray-Slutsky & Paris, 2005). Alternatively, sensory difficulties may be a consequence for children who have not experienced a secure and loving attachment with a caregiver, possibly due to parental mental illness, neglect, bereavement etc. In such situations it is proposed that lack of affection and lack of general sensory stimulation combined with high levels of anxiety may cause SPDs (Lin et al., 2005) due to children failing to learn to effectively regulate their emotions and make appropriate responses to sensory inputs (Bhreathnach, 2008). Encouragingly, there is evidence that severely neglected children often recover well when placed in loving foster homes (Van den Dries et al., 2010).

5.7.2 Association between Reported Anxiety and SPDs

62 parents rated their child as being generally anxious. There was a significant relationship between parental anxiety ratings and seven of the eight parental sensory measures. However, like the findings for the 'Fussy Baby' category only a few associations were evident on the SC.

The significant relationship found between anxiety and SPDs in this sample is pertinent because high levels of anxiety can cause inappropriate fright, fight or flight responses (Dunn, 1999; Gavin et al., 2011) and also interrupts the child's ability to concentrate on learning (Aronen, Vuontela, Steenari, Salmi & Carlson, 2005).

Children who are over-responsive or who have difficulties regulating their sensory responses may perceive the world to be very intense and overwhelming and may find sensations threatening that are usually considered to be innocuous by others (Ben-Sasson et al., 2009). Such experiences lead to high levels of anxiety which in turn may be translated into a range of problematic behaviour in school.

Children who are anxious may find it difficult to settle to tasks requiring high levels of concentration, which may make them appear to be hyperactive (Schoen et al., (2009). Reports of high levels of hyperactivity in this sample have been discussed in relation to children seeking high levels of sensory input. However, 40-47% of the sample was rated as being anxious. It is suggested that some children in the sample may appear overactive due to anxiety, which may cause them to perceive everyday sensations as threatening (Gavin et al., 2011). It should be noted that according to this argument it follows that some sensory difficulties (particularly sensory over-responsivity) may be induced by environmental influences, rather than stemming from a sensory dysfunction evident from birth.

Hence, observations of overactivity provide an example of how, according to sensory processing theory, the same behaviour may be the consequence of very different issues. It is suggested that a sensory seeking child may benefit from increased levels of sensations for example through increased levels of physical activity (Dunn, 1999). Whereas a highly anxious child may be experiencing sensory overload and need to withdraw to a quieter environment (Ben-Sasson, 2009). It is for this reason that it is proposed that for this sample an awareness of the child's possible sensory needs could be informative when supporting their behavioural issues in school.

While the child's anxiety (rated by the parent) was associated with many sensory measures on the SSP, significant associations were only found on two of the possible 9 sensory measures on the SC, indicating that teachers had often not noted sensory difficulties in children who have been rated as anxious by their parents. There was a significant association between the parental anxiety rating and the teacher anxiety rating (p=.006) with parents and teachers agreeing on their rating of 81 children. So, although many children were rated as being anxious both at home and school, 49 children were only rated as being anxious in only one setting. This suggests that for this sample there may be factors connected with anxiety that are specific to a particular setting, for example, a noisy crowded environment at school or perhaps a difficult relationship with a relative at home. It is also possible that some children may endeavour to hide their anxiety from certain adults and so apprehension may remain undetected. There was a close association between the teacher anxiety rating and 'Tolerance for Sensory Input' (p<.001) and 'Availability for Learning' (p<.001), which are both School Factors on the SC. It is important for schools to comprehend that this study tentatively indicates that some anxious children may experience sensory overload at school which may lead to outbursts or other unexpected behaviour as the child either panics or tries to withdraw from a situation (Ben-Sasson, 2009). In addition the results of this study suggest that some anxious children in this sample may not be able to focus on learning because they are distracted by other worries, which may lead to task failures in class and possible reprimands from school staff (Gathercole & Alloway, 2009).

5.8 Associations between SPDs and SDQ measures

The data were analysed to see if there was an association between the sensory measures and the sub types of BESD as measured by the SDQ. Most notably there was a significant association between difficulties in ‘Peer Relations’ and four SSP measures and eight SC measures. The significance of difficulties with ‘Peer Relations’ and Total measures on the SSP and SC was $p<.001$. This association is surprising considering that the other social measure on the SDQ, ‘Pro-social Behaviour’, had no significant associations with any of the sensory measures. This indicates that there is a group of children in this sample who have been noted to be typically helpful and kind in school but who have specific difficulties with peer relations and many pupils in this group have also been rated as having sensory difficulties both at home and at school. Links have also been drawn between social competence and BESD (e.g. Hartnell, 2010 and Poulou, 2005) but this data also suggests possible links with SDPs. Difficulties with social understanding and hence peer relations are a common difficulty in children who experience ASD (Baranek, 2002). Hence, it is possible that this result further supports the evidence that a number of previous studies have identified between ASD and SPDs.

The associations between poor peer relations and SPDs have been noted in other studies for example Hilton et al. (2010) and Schaaf et al. (2010). Hilton et al. (2010) found correlations between sensory responsiveness and severity of social difficulties in children with high functioning autism. This indicates that the more severe the child’s SPDs the greater the observed social difficulties. Interestingly difficulties with taste / smell and touch were the most closely associated with social difficulties (Hilton et al., 2010). The current study showed a significant association for touch but not taste / smell, which may reflect the different pattern of difficulties seen in ASD pupils compared to BESD pupils in this sample as discussed in section

5.4.4. It is easy to imagine how a person who is oversensitive to smell or touch would prefer to avoid close contact with other people and hence would miss out on a range of social opportunities. Such children may also be actively distressed by unexpected touch arising from crowded situations and may overreact (Dunn, 1999), which in turn will be confusing and possibly irritating to their peers. It should be noted that 7% of children (n=9-10) in the current study were reported to have an ASD diagnosis as well as BESD. So for these children difficulties with peer relations and sensory difficulties would be expected.

The importance of good sensory modulation in enabling children to respond appropriately during interactions is highlighted by Ben-Sasson et al. (2009) as follows:

> '*Taking a friend's perspective, cooperating during a problem solving task, and considering others' emotional states are examples of adaptive social behaviors. Regulated sensory responsivity is particularly important for adaptive social behaviors as (1) social interaction requires a flexible response to multiple, simultaneous, on going, and unpredictable input, and (2) adequate sensory responsivity allows one to notice social cues and respond positively to the input involved in social interactions (e.g. light touch, loud voices)* (p 707-8).

The SC measure 'Availability for Learning' showed significant associations with four of the SDQ measures and a particularly significant association with emotional difficulties ($X^2 = 21.54$ (1) $p<.001$). This may be because, as noted by Dyregrov (2004), children who experience emotional difficulties are often preoccupied by their worries and hence appear distracted in class and have difficulties focusing on learning.

There were significant relationships between many of the SDQ measures and the SC sensory processing measures. In particular children who were rated as having overall BESD on the SDQ Total Score had a significant relationship on seven SC sensory measures, indicating that children with more severe BESD were more likely to be rated as also having sensory difficulties. Interestingly the only association between total SDQ scores and SSP sensory measures was with the Movement measure on the SSP ($X^2 = 4.12$ (1) $p<.05$), which indicates that sensory and Total SDQ score associations for this sample were not observed at home.

5.9 Awareness of SPDs in the Field of Education

It is proposed that many BESD children have complex needs and their BESDs may be caused by a variety of factors (Jull, 2008). There is no doubt that behaviour management techniques such as firm boundaries & routines and consistent rewards & sanctions may prove to be effective in supporting many children with BESD. The SSP and SC are only able to measure sensory difficulties based on adults' observations of the child's behaviour and this is a subjective measure.

SPDs are most commonly assessed by occupational therapists. The data showed that only 14-23% of participants had been assessed by an occupational therapist, which is concerning considering between 44-55% of the pupils were rated as having SPDs in this survey. The data indicate that it may be beneficial for occupational therapists to have more involvement with the BESD children in this sample and to liaise with school staff about supporting the needs of these children. However, in a time of NHS and local authority cuts it may not be possible for occupational therapists to further extend their services to include more children with BESD. As a result, it is suggested that it would be pertinent to raise awareness of SPDs among school staff so that teachers can consider a possible sensory basis for some of the troublesome behaviours. This may help staff to perceive certain BESD children in a more positive light rather than possibly concluding that the child is being deliberately difficult. This is relevant because undesirable behaviour has been seen to generate negative teacher attitudes towards the child (Kokkinos et al., 2004), which in turn may impact on the child's success at school (Willingham, 2009). Good emotional bonds between teacher and pupil have been found to have an important impact on the child's motivation and success at school (Geving, 2008).

SPDs can be directly measured by Somatosensory Evoked Potentials and Electroencephalography etc. but this requires considerable expertise and sophisticated equipment that is not available to schools. Hence, while it is acknowledged that the sensory profile has its limitations and was only intended as a screening questionnaire it does provide a structure for supporting schools in starting to consider possible sensory difficulties when planning how to assist children with BESD. In the absence of other means of assessing children's sensory needs it is suggested that sensory questionnaires are useful. This study was not designed to establish a causal link to indicate whether sensory issues are responsible for all or part of a child's BESD and it has been found that BESD children exhibit many behaviours seen in children with SPDs. This indicates that challenging behaviours in some children may stem from SPDs, whereas other children's behaviours may have a very different foundation. In order to successfully hypothesise about the cause of particular children's behaviour, professionals need to work closely with the child's family and school to collect background information and make detailed observations about exactly which behaviours are considered problematic and how the child has responded to intervention.

Sensory processing is a complex area because children may have difficulties in a variety of sensory areas. Hence, two children with sensory difficulties may present with very different concerns, for example if one child is over-sensitive to noise and another is under-sensitive to touch and proprioception. In addition, sensory processing theory suggests that children with sensory modulation difficulties fluctuate in the way that they respond to sensory inputs (Dunn, 1999). This can present a very complex pattern of behaviour for teachers to interpret as the child may appear to be very overactive in some situations and sluggish at other times. Hence, considerable specialist knowledge is required to assess and remediate SPDs and it perhaps would not be reasonable to expect many class teachers to acquire such knowledge. However a basic awareness of sensory issues would enable class teachers to question whether a troublesome behaviour might have a sensory cause and if appropriate request more specialist support from the school SENCo, occupational therapist or educational psychologist.

The SENCo questionnaire provided brief information about SENCo's level of knowledge about SPDs. The results indicate that a large number of SENCos have a poor understanding of terms associated with sensory processing, such as 'Tactile Defensiveness' and the 'Vestibular Sense' (between 64-84% depending on the terminology.) 38% of SENCOs in this sample felt that they could not confidently identify behaviour that might have a sensory cause and 71% rated that teachers and teaching assistants in their school did not know how to identify and support pupils with sensory processing disorders. These scores indicate that SPDs are poorly understood in the primary schools where the research took place. As a result, it is cautiously suggested that certain members of school staff (e.g. SENCos) might benefit from training on typical sensory processing, the associations between SPDs and diagnoses such as ASD and foetal alcohol syndrome and also the potential link for some children between sensory difficulties and BESDs.

It is proposed that it may be helpful to raise awareness among educational psychologists about possible sensory difficulties that may impact on children's behaviour. This study suggests that an awareness of sensory difficulties may be relevant to 44-55% of the BESD children in this sample. However, research suggests (e.g. Ermer & Dunn, 1998 and Mangeot et al., 2001) that knowledge of sensory difficulties would also aid educational psychologists who are supporting children with a range of other difficulties such as ASD and ADHD. The lack of research into sensory difficulties in the field of educational psychology and lack of discussion of sensory processing difficulties in educational psychology peer reviewed journals indicates that the evidence surrounding these issues is currently being overlooked by the profession. Appropriately trained educational psychologists would be well placed to support school staff in supporting children with SPDs, ideally also in conjunction with occupational therapists. In this way it is hoped that knowledge of SPDs (based on peer-reviewed research rather than on well marketed interventions) may gradually penetrate further into the realm of education.

5.10 Limitations

The research design does not allow any conclusions to be drawn about the causes of either the children's sensory needs or their BESD. A number of other possible limitations are discussed below.

5.10.1 Limited Number of Participants

Although every effort was made to include a large number of pupils in this study, complete data was only achieved for 131 pupils. Considering the challenges in engaging parents of BESD children, the number of participants should in some respects be celebrated. The size of the study is certainly an improvement on some of the very small scale studies that have explored sensory processing difficulties (e.g. Schilling et al., 2003; and Schneider et al., 2008). However, considerably less data were obtained for this study than other studies of prevalence in non-clinical populations. For example, Ahn et al. (2004) obtained data from 703 parents and 1,039 families responded to Ben-Sasson et al.'s (2009) survey into the prevalence of SOR. Hence, any generalisation of these results to other BESD children must be undertaken with considerable caution.

5.10.2 Heterogeneous Sample

A common criticism of much SPDs research is that the samples are heterogeneous groups of pupils with a wide range of difficulties and so it is difficult to draw conclusions about patterns of need or effectiveness of interventions. It is acknowledged that the inclusion criteria of this study resulted in a very disparate sample with children displaying varied sensory needs but also a very wide range of behavioural emotional and social difficulties, which may have stemmed from a large combination of factors. However, a number of studies have investigated SPDs within populations with specific diagnoses, whereas this research sought to examine SPDs in pupils who had been observed as having BESDs in school despite not necessarily having a diagnosis of any kind. While the research is unable to claim causal links or make recommendations for individual children it has succeeded in demonstrating that SPDs may be applicable to 44-55% of the BESD sample.

5.10.3 Measures of SPDs

It has been acknowledged that the SSP and SC are only brief screening questionnaires and that a more thorough assessment of each child's sensory needs would have been desirable. As stated by Dunn (2006) the sensory profile questionnaires were intended to be combined with other '*evaluations, observations and reports*' (p1) to form a comprehensive assessment of a student's needs. Hence the use of screening questionnaire's to identify a difficulty may result in inaccuracies in the identification of sensory difficulties in some children, compared to an individual assessment. However, as has been discussed in section 3.1.3.a and 5.4.3 the SSP has been validated against samples where SPDs have been identified by individual assessment and direct measures of sensory responses, which suggests good construct validity and that the data provided by the SSP does provide an indication of the prevalence of sensory processing difficulties in this sample. However, no studies have validated the SC against direct measures of sensory responses or against samples where SPDs were measured by individual assessment. This means that the data provided by the SC may be less valid than those provided by the SSP, although there is currently no published data that would enable a comparison between the validity of the SSP and SC to be drawn.

Conversely, an advantage of the SC is that it was standardised more recently than the other questionnaires meaning that the standardisation may be a more accurate representation of current children compared to the SSP and SDQ which were standardised on samples 12 or more years ago. Dunn (2006) reports that the SC only shows moderate correlations with results from the full Sensory Profile Caregiver Questionnaire (a longer version of the SSP). She states that a moderate correlation is to be expected because children's sensory responses will vary for environmental reasons in different settings. While the suggestion that environmental influences may affect the way in which children process sensory information is supported in the discussion of this study, it is possible that only moderate correlations were found due to issues with the validity of the SC. This issue can not be resolved until further studies are conducted to validate the SC against other measures of SPDs.

An advantage of using the SSP is that it has been used in many previous studies and hence it is possible to directly compare the results between studies such as Tomchek & Dunn (2007). However, it has been found that the SSP and SC are problematic measures when it comes to directly comparing parental and teacher responses. In addition, in order for comparisons to be made, an SC Total Score was created, which evidently has not been party to the SC tests of reliability and validity during the development of the SC. Hence any conclusions drawn from the SC Total score can only be tentative. Comparison between parental and school responses might have been easier if the Sensory Processing Measure (SPM) had been used as the measure of sensory processing. The SPM has the same seven sensory sections for both parents and teachers, and both questionnaires can be summed to provide a total score. In addition, the parental form is longer (75 questions) than the SSP and hence provides more detailed information without being as lengthy as the full sensory profile (125 questions). At the time of data collection the SMP was only available in America and would have been prohibitively expensive for this study, but it presents a promising tool that should be considered for future research.

5.10.4 Identification of BESD

A major drawback of the research was that, with the exception of the 29 children nominated by the PBST and the 18 children from the BESD special school, teachers were relied upon to nominate children for the study by simply picking out children that they felt had BESD. In discussing the research with different schools it soon became clear that teachers had very different assumptions about what was BESD and what was not. For example, schools with few challenging pupils may have rated a child as having severe BESD on the SDQ questionnaire, but if that same child was in a different school which had a high number of pupils with significant needs the child's behaviour may not have been considered a cause for concern. Hence, the inclusion of children in the study was a very subjective process. The discrepancies between schools were most clear when discussing participants from the specialist BESD school. A number of participants from this school were excluded from the research because teachers rated that they did not have BESD and yet they were attending the special school due to persistent, severe concerns with BESD. The issue was raised with the SENCo who agreed that all the children in the school had BESD, but that the behaviour of some pupils was so extreme that other children's difficulties seemed inconsequential by comparison. Hence although the SDQ provided a standard measure of BESD for all children and was completed by an adult that knew the child well, it is clear that the teachers' assumptions about BESD varied considerably from one school to another, meaning that the inclusion measure in the study was highly subjective and variable.

The cut-off set by the authors of the SDQ to identify children with BESD was more liberal than the cut-off set by the authors of the SSP and SC. This suggests that the SDQ criteria for 'Abnormal' is a broader category than the cut-offs set by the sensory measures. This may have allowed children with fairly mild BESD to be included in the sample.

Schools regularly reported that pupils with the most severe BESD were not included in the study, either because the parents did not return the consent forms or because the relationship with the parent was so fragile that it was not appropriate to invite them to take part in the research. Hence, this study includes 7% of children whose total BESD difficulties score on the SDQ was normal, 26% whose scores were borderline and only 67% were rated as having overall difficulties with BESD. It could be argued that the inclusion criteria was not rigorous enough, however the decision to include pupils with BESD in only one area (e.g. emotional difficulties) has enabled an analysis of sensory needs of children who specifically have difficulties with social, emotional **or** behavioural difficulties rather than just examining children with difficulties in all three areas.

5.10.5 Change of Descriptive Terms on the Standardised Measures

As highlighted in section 3.6.1 the descriptive terms of the standardised measures were altered to aid ease of reading and reporting of the results. Hence the SDQ category 'Abnormal' and the SSP & SC categories 'Definite Difference' were all give the same term 'Difficulties'. However, this change in terminology may be taken to imply that the 'Difficulties' and 'Probable Difficulties' categories are calculated using the same cut-offs on the SDQ, SSP and SC. It is acknowledged that this is not the case as the SDQ cut-off is more liberal than the sensory measures and so the use of the same terms on all the measures could be misleading. In addition terms such as 'definite difference' were selected during the development of the SSP and SC as a meaningful description of certain children's scores based on Dunn's model of sensory processing. Altering the terminology runs the risk of subtly changing the implied needs of children in each category in readers' minds.

5.10.6 Background Factors

There was an intention to investigate whether associations were found between SPDs and other clinical diagnoses, as has been found in previous research. However, only a very small number of children were rated as having many of the background difficulties, hence the statistical base was so small that no firm conclusions could be drawn when exploring associations between factors. As the main intention of the study was to focus on pupils displaying difficulties at school but without a clinical diagnosis, it appears that attempting to investigate the needs of those with diagnoses was unnecessary. However, collecting data on other diagnoses enabled the confirmation that the majority of participants did not have a diagnosis that is commonly associated with SPDs (e.g. ASD, ADHD).

It would have been interesting to investigate the links between children with an ADHD diagnosis with movement and sensory seeking difficulties on the SC. However, no significant relationship was found between these factors and only eight pupils were identified by teachers as having an ADHD diagnosis. Unfortunately, the study did not record how many of these pupils were taking stimulant medication, as the medication may have significantly modified their behaviour.

In addition to adding to the pool of knowledge about SPDs this study has raised a number of questions that would benefit from future research. These are discussed in the final chapter.

Chapter 6

Conclusions

6.1 The Impact of the Results on Sensory Processing Theory

Current literature suggests that the theory of sensory processing is not without controversy. While there is increasing evidence that SPDs are a reality for certain children (e.g. Parush et al., 2007; McIntosh et al., 1999; and Davies & Gavin, 2007), Sensory Processing Disorder is not yet recognised as an independent disorder in DSM-IV and the literature review indicates that there is a lack of research into SPDs in the UK. There is increasing evidence that SPDs are associated with specific diagnoses, in particular ASD (e.g. Ermer & Dunn, 1998; and Dawson & Watling, 2000), but the results from this study suggest that understanding of SPDs in mainstream schools remains limited, as is shown by the results of the SENCo questionnaire. This research may raise awareness of possible SPDs in the BESD population at school. The results are in line with previous research that has noted that a proportion of children with SPDs also experience BESD (Ben-Sasson et al., 2009; Goldsmith et al., 2006; Hilton et al., 2007; and Franklin et al., 2008). This study also supports the suggestion that not all children with BESD experience SPDs; rather it is cautiously proposed that within this BESD sample it is possible to distinguish a subgroup of children with SPDs. Previous research has focused on children already identified as having SPDs or another diagnosis with behaviour difficulties being seen as a consequence. This study has sought to focus on observed behavioural emotional or social difficulties at school and has found that a large subgroup of the BESD sample may also have SPDs, as was found in previous studies of children with ADHD (Mangeot et al., 2001 and Parush et al. 2007).

The fact that the results of this survey suggest a high level of sensory difficulties in children with BESD compared with typical children, adds weight to the theory of sensory processing, by showing that some children are reported to respond to sensations differently compared with typical children. However, these results do not suggest causality beyond the observation of a number of factors that appear to be associated the SPDs such as anxiety and difficulties with peer relations. It is cautiously proposed that rather than always being a ‘within child’ difficulty as is suggested by the term sensory processing disorder, it is possible for children to acquire sensory difficulties due to environmental influences such as high levels of background noise or limited opportunities for physical activity.

6.2 Suggestions for Future Research

The results tentatively suggest that between 44-55% of the sample may have SPDs and so consideration should be given as to how these children may be best supported in school. In order to investigate this, it may be timely to devise a programme of sensory strategies for BESD children according to their observed sensory need and then monitor the efficacy of the strategies in reducing the children's problematic behaviours at school. Any trial would need to be rigorously designed so as to avoid the criticisms of design flaws that have plagued many studies investigating the efficacy of sensory integration therapy (Miller, 2007).

It would be helpful to replicate this research with a much larger sample and more thorough measures of SPDs and BESD. A future study might benefit from using the Sensory Processing Measure to screen pupils before conducting more thorough assessment by an occupational therapist for those pupils who were found to have sensory difficulties on the screening measure. A future study might also collect more thorough data on other factors that may affect the child's behaviour, such as parenting skills, socioeconomic status, diet, exercise, sleep patterns, relationships with caregivers, hours of outdoor play, exposure to television and computer games etc. so that links may be investigated between the prevalence and associations between variables such as SPDs, environmental influences and observed BESDs in school.

It may be helpful for forthcoming research to be conducted through institutions such as special educational provision for BESD or specialist child and adolescent mental health services. This should enable children with severe BESDs to be targeted because many children reported by schools as having the most severe needs did not take part in this research. If the research was run by professionals who had regular long term contact with the families, it would be more likely to be able to collect detailed data about a range of factors in the lives of the children and the long term effects of interventions could be tracked over time.

In the discussion section it is hypothesised that some children are exposed to high levels of background noise and that this may be affecting their attention and auditory filtering skills (Flagg-Williams et al., 2011). A study which actually records the noise levels that a range of children are exposed to over a number of weeks could be enlightening. Evidence could be collected to measure whether there is an association between the level of noise in children's lives and attention and auditory filtering difficulties.

Ashburner et al., (2008) found that ASD children with difficulties in auditory filtering and sensory seeking were more likely to underachieve academically. A future study could investigate whether this pattern is also true for BESD children. If a correlation is found between certain sensory issues and underachievement in school it might impress on teachers that an understanding of sensory processing may be pertinent when seeking educational success.

Finally, it has been noted that, unlike the SSP, no study has examined the SC to establish a correlation between abnormal EDR measurements and low scores on the SC. This may be a useful exercise to strengthen evidence of the construct validity of the SC.

6.3 Practical Implications for Schools and Educational Psychology

It is suggested that one of the many possible roles of an educational psychologist is to support schools in managing BESD pupils. Some of these pupils have very complex needs that are difficult to accommodate in school (Jull, 2008); hence any information that may help EPs to better understand BESD pupils should be welcomed. While aspects of the literature surrounding sensory processing remain open to debate, there is increasing evidence that a proportion of children experience SPDs and that there is a considerable overlap between behaviours observed in children with SPDs and troublesome behaviour witnessed by teachers in class (Ben-Sasson et al., 2009 and Franklin et al., 2008). The theory of sensory processing provides an alternative approach to some more traditional methods which may be used such as behaviourist techniques that involve applying rewards to change behaviour.

Psychologists may perform a number of functions when working with BESD pupils. For instance it might be appropriate to collect evidence about exactly what behaviours the child is displaying, what has triggered those behaviours and how adults have responded to those behaviours. The psychologist may then put this information in the context of all the other influences on the child's life, such as the school ethos, teaching styles, parenting skills, stresses and significant events at home etc. Schools and parents may look to psychologists to make sense of an apparently confused situation and to help the key players develop a way to move the situation forward. Within such a process, knowledge of sensory processing may be useful because it provides a possible explanation for behaviour that might otherwise be overlooked and opens up a range of possible strategies that can be used in conjunction with more traditional behaviour management techniques. It is proposed that another vital aspect of an EP's role often involves shifting the perceptions of the key players in a difficult situation. This may be very relevant for pupils with SPDs because, if their behaviour is not understood, they may be perceived as being deliberately difficult and hence generate considerable frustration in the adults in their lives. Knowledge of sensory processing theory may aid EPs in being instrumental in shifting adults' perceptions so that they understand and support the child in managing their behaviour in a more positive light.

Identifying SPDs can be a complex task requiring considerable specialist knowledge because children may have similar sensory symptoms for very different reasons. Until now this knowledge has usually been held by occupational therapists, but this study indicates that only 14-23% of the BESD sample had been assessed by an occupational therapist. This suggests that it may be beneficial for sensory processing knowledge to be further disseminated within the field of education. It is proposed that educational psychologists may be in a good position to facilitate this task because they regularly support schools with children who are experiencing difficulties, are often skilled in delivering training and have the analytical skills to examine a range of evidence about a child's behaviour and develop hypotheses about the best way to proceed. Finally, it is hoped that EPs may be able to foster closer working relationships between occupational therapists and schools, both in providing general information on good practice for all children and through joined up working with particular children who are causing concern.

Awareness of sensory issues is increasingly filtering into schools, homes and popular culture in the UK. This is partly through a number of well known books such as the ‘Out-of-Sync Child’, (Kranowitz, 1998) and ‘Too Loud Too Bright Too Fast Too Tight’ (Heller, 2003). Institutions such as the Sensory Integration Net are expanding in the UK. The importance of understanding the senses is becoming popular within Special Educational Needs as was reflected in the catalogue of the ‘Special Educational Needs Show: London’ in October 2011. The cover pictured an eye, ear, nose etc. and stated the importance of learning through the senses. At this event many exhibitors displayed sensory toys or sensory rooms and soft play areas. Popular knowledge of sensory difficulties is also likely to be increased by high profile films such as ‘Extremely Loud and Incredibly Close’ which was released in the UK in 2012. The film features a boy with sensory sensitivities coming to terms with the death of his father in the terrorist attacks on the ‘Twin Towers’ in New York.

While such interest in sensory needs is to be welcomed it is important that practice is evidence-based and does not become overtaken by popular interventions which seek to brand and overcomplicate children’s difficulties (Goldacre, 2009). As sensory issues are increasingly discussed by parents and schools, it is suggested that it is important the EPs are well informed about the current controversies surrounding SPDs and it is hoped that EPs might be instrumental in driving future research and evidence-based practice.

Finally, it is suggested that there is certainly an on-going need for further study into the prevalence and remediation of SPDs in education. It has been shown in this study that both parents and teachers have concerns about poor listening skills, attention skills and overactivity in children with BESD. Whatever the causes of these difficulties, it is hoped that EPs will continue to strive to reduce the barriers to success faced by many BESD children so that they have the opportunity to thrive within the British education system.

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Appendix 1a: The Strengths and Difficulties Questionnaire

Strengths and Difficulties Questionnaire

T^{4-16}

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of the child's behaviour over the last six months or this school year.

Child's Name .... Male/Female

Date of Birth..

	Not True	Somewhat True	Certainly True
Considerate of other people's feelings	☐	☐	☐
Restless, overactive, cannot stay still for long	☐	☐	☐
Often complains of headaches, stomach-aches or sickness	☐	☐	☐
Shares readily with other children (treats, toys, pencils etc.)	☐	☐	☐
Often has temper tantrums or hot tempers	☐	☐	☐
Rather solitary, tends to play alone	☐	☐	☐
Generally obedient, usually does what adults request	☐	☐	☐
Many worries, often seems worried	☐	☐	☐
Helpful if someone is hurt, upset or feeling ill	☐	☐	☐
Constantly fidgeting or squirming	☐	☐	☐
Has at least one good friend	☐	☐	☐
Often fights with other children or bullies them	☐	☐	☐
Often unhappy, down-hearted or tearful	☐	☐	☐
Generally liked by other children	☐	☐	☐
Easily distracted, concentration wanders	☐	☐	☐
Nervous or clingy in new situations, easily loses confidence	☐	☐	☐
Kind to younger children	☐	☐	☐
Often lies or cheats	☐	☐	☐
Picked on or bullied by other children	☐	☐	☐
Often volunteers to help others (parents, teachers, other children)	☐	☐	☐
Thinks things out before acting	☐	☐	☐
Steals from home, school or elsewhere	☐	☐	☐
Gets on better with adults than with other children	☐	☐	☐
Many fears, easily scared	☐	☐	☐
Sees tasks through to the end, good attention span	☐	☐	☐

Do you have any other comments or concerns?

Please turn over - there are a few more questions on the other side

Appendix 1a continued:

Overall, do you think that this child has difficulties in one or more of the following areas: emotions, concentration, behaviour or being able to get on with other people?

	No	Yes- minor difficulties	Yes- definite difficulties	Yes- severe difficulties
	☐	☐	☐	☐

If you have answered "Yes", please answer the following questions about these difficulties:

• How long have these difficulties been present?

	Less than a month	1-5 months	6-12 months	Over a year
	☐	☐	☐	☐

• Do the difficulties upset or distress the child?

	Not at all	Only a little	Quite a lot	A great deal
	☐	☐	☐	☐

• Do the difficulties interfere with the child's everyday life in the following areas?

	Not at all	Only a little	Quite a lot	A great deal
PEER RELATIONSHIPS	☐	☐	☐	☐
CLASSROOM LEARNING	☐	☐	☐	☐

• Do the difficulties put a burden on you or the class as a whole?

	Not at all	Only a little	Quite a lot	A great deal
	☐	☐	☐	☐

Signature .... Date ....

Class Teacher/Form Tutor/Head of Year/Other (please specify:)

Thank you very much for your help

Appendix 1b: SENCo Questionnaire

Questionnaire for SENCos

This questionnaire is purely to build up a picture of the current level of knowledge about Sensory Processing Difficulties across the local authority. Your response will be anonymous.

Key:	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

Please indicate what type of school you work for:

Special School/SRP: ☐ **Mainstream School:** ☐

	Statement	1	2	3	4	5
I have a good understanding of the following:						
1	• sensory processing disorder (also known as sensory integrative dysfunction)	☐	☐	☐	☐	☐
2	• sensory modulation disorder	☐	☐	☐	☐	☐
3	• the vestibular sense	☐	☐	☐	☐	☐
4	• the proprioceptive sense	☐	☐	☐	☐	☐
5	• tactile defensiveness	☐	☐	☐	☐	☐
6	I am confident I can identify behaviour that might have a sensory cause.	☐	☐	☐	☐	☐
7	I am familiar with strategies and resources to support children with sensory processing difficulties	☐	☐	☐	☐	☐
8	I know where to find strategies and resources to support children with sensory processing difficulties	☐	☐	☐	☐	☐
9	Teachers and TAs in my school know how to identify and support sensory processing difficulties	☐	☐	☐	☐	☐

You may add further comments here if you would like to:

Thank you for your time. Please return to
Plum Hutton, Educational Psychology Service in the envelope provided.

Appendix 1c: Parent / Carer Background Information Sheet

Parent / Carer Form: Background Information

The following background information would be very helpful. If you would like an explanation of how each question is relevant to this research please see overleaf.

You do not have to answer all the questions. This information will only be seen by the researcher.

Child's identification number:	School:

		Yes	No	Not sure
1	Was your child born prematurely i.e. before 37 weeks gestation?	☐	☐	☐
2	Were there complications during labour or delivery of your child?	☐	☐	☐
3	Was your child a fussy or 'difficult' baby?	☐	☐	☐
4	Do you feel that your child is generally anxious?	☐	☐	☐
5	Has your child been assessed by an Occupational Therapist?	☐	☐	☐
Please indicate if your child been diagnosed by a specialist as having any of the following:		Yes	No	Not sure
6	ADHD (Attention Deficit & Hyperactive Disorder)	☐	☐	☐
7	ASD (Autistic Spectrum Disorder including Asperger's and Pervasive Developmental Disorder)	☐	☐	☐
8	Attachment Difficulties	☐	☐	☐
9	DCD (Developmental Co-ordination Disorder including Dyspraxia)	☐	☐	☐
10	Dyslexia	☐	☐	☐
11	Any other learning difficulty or significant medical problem. If yes, please give brief details below:	☐	☐	☐

PLEASE RETURN QUESTIONNAIRES TO YOUR CHILD'S SCHOOL WHERE THEY WILL BE FORWARDED TO THE EDUCATIONAL PSYCHOLOGY SERVICE.

Appendix 1c Continued:

Explanation of how the background information is relevant to this research.

Reasons for asking the questions on the background information sheet:

Question Number

1 & 2: To identify if there is a link between sensory processing difficulties, prematurity and difficulties at birth in this sample. Some other studies have found links between these factors.

3: Many children who over-respond to sensory input are reported to be fussy or ‘difficult’ babies. This question provides an indication of whether difficulties have been evident from an early age and hence longstanding. It should be noted that many ‘difficult babies’ do not develop any difficulties in later life.

4: Detailed assessment of sensory difficulties is usually undertaken by an occupational therapist. It would be helpful to find out how many children who are felt to have behavioural, emotional or social difficulties in school have been assessed by an occupational therapist.

5: Some studies have found strong links between anxiety and sensory difficulties. It would be helpful to establish whether there are links between anxiety and sensory difficulties in this sample.

6-11: These questions aim to provide further evidence about the links between sensory processing difficulties and other difficulties. For example some studies have shown links between dyslexia and difficulties filtering out background noise. Other studies have found that many pupils with ADHD (Attention Deficit Hyperactive Disorder) are oversensitive to touch. Many studies have shown that a high percentage of children on the autistic spectrum also experience sensory processing issues. It should be noted that children may have sensory sensitivities without any other diagnosis.

Background information provided by teachers.

Your child’s teacher will be asked to complete a similar background information sheet but it does not include questions about your child’s early development. Teachers are asked the following questions:

1. Does this child have academic difficulties at school?
2. Does this child’s behaviour in school negatively impact on their ability to learn?

Question 1 & 2 provide information about whether the child’s difficulties may be due to academic difficulties in school which can lead to problem behaviour or whether their behaviour is impacting on their ability to learn. Sensory processing difficulties can cause children to be over active, controlling, to have difficulties listening etc. which will all impact on the child’s ability to learn.

Questions 3-10 cover the same content as questions 4-11 on the parent background information sheet.

Appendix 1d: Teacher Background Information Sheet

Teacher Form: Background Information

The following background information would be very helpful. If you would like an explanation of how each question is relevant to this research please see overleaf.

You do not have to answer all the questions. This information will only be seen by the researcher.

Child's identification number:		School:		
		Yes	No	Not sure
1	Does this child have academic difficulties at school?	☐	☐	☐
2	Does this child's behaviour in school negatively impact on their ability to learn?	☐	☐	☐
3	To your knowledge has this child been assessed by an Occupational Therapist?	☐	☐	☐
4	Does this child appear to be generally anxious?	☐	☐	☐
Please indicate if this child been diagnosed by a specialist as having any of the following:		Yes	No	Not sure
5	ADHD (Attention Deficit Hyperactive Disorder)	☐	☐	☐
6	ASD (Autistic Spectrum Disorder including Asperger's and Pervasive Developmental Disorder)	☐	☐	☐
7	Attachment Difficulties	☐	☐	☐
8	DCD (Developmental Co-ordination Disorder including Dyspraxia)	☐	☐	☐
9	Dyslexia	☐	☐	☐
10	Any other learning difficulty or significant medical problem. If yes, please give brief details below:	☐	☐	☐

PLEASE RETURN QUESTIONNAIRES TO THE SENCO WHO WILL FORWARD THEM TO THE EDUCATIONAL PSYCHOLOGY SERVICE.

Appendix 1d Continued:

Explanation about how the background information is relevant to this research.

Reasons for asking the questions on the background information sheet:

Question Number
1 This question provides information about whether the child's difficulties may be due to academic difficulties in school, which can lead to problem behaviour.

2 Children with behavioural, emotional or social difficulties in school often have difficulties with learning as a result of their behaviour. Sensory processing difficulties can cause children to be over active, controlling, to have difficulties attending etc. which will all impact on their ability to learn.

3 Detailed assessment of sensory difficulties is usually undertaken by an occupational therapist. It would be helpful to find out how many children who are struggling to manage their behaviour in school have been assessed by an occupational therapist.

4 Some studies have found strong links between anxiety and sensory difficulties. Anxiety is not directly asked about in the Sensory Profile.

5-10 These questions aim to provide further evidence about the links between sensory processing difficulties and other difficulties. For example some studies have shown links between dyslexia and difficulties filtering out background noise. Other studies have found that many pupils with ADHD (Attention Deficit Hyperactive Disorder) are oversensitive to touch. Many studies have shown that a high percentage of children on the autistic spectrum also experience sensory processing issues. It should be noted that children may have sensory issues without any other diagnosis.

Appendix 2a: Parent / Carer Introductory Letter

School of Psychology
Cardiff University
Tower Building,
Park Place
Cardiff,
CF10
3AT

September 2010

Dear Parent / Carer,

I am an Educational Psychologist working in XXXX and studying for a doctorate in Educational Psychology at Cardiff University. I am conducting research into children who experience difficulties processing sensory information. For example, a child might be oversensitive or under-sensitive to touch, noise, movement, taste, texture etc., which may make it more difficult for him/her to concentrate and learn in school. Some children find it more difficult to manage their behaviour in school than others. This may be due to a number of reasons such as difficulties with attention, over activity, anxiety, bereavement, or disruptive behaviour etc.

This study aims to answer the following questions:

1. How many children with behavioural, emotional or social problems at school also experience sensory issues?
2. Do children show a similar pattern of sensory processing at home and at school?

Please could you spend a few minutes completing the attached Background Information Sheet and questionnaire? Background information will enable links to be drawn between sensory processing difficulties and other factors. For example, medical conditions or learning difficulties that have been previously diagnosed by a specialist. An explanation of the reason for asking each background question is provided on the reverse side of the Background Information Sheet.

If you take part in this study your child's teacher will also be asked to complete the following:

- A Background Information Sheet.
- The Strengths and Difficulties Questionnaire: this is a brief questionnaire commonly used in schools. It provides information about 5 aspects of a child's behaviour at school including emotional issues, conduct problems, hyperactivity, peer problems and social strengths.
- The Sensory Profile School Companion: this survey has 62 questions and provides information about how a child processes sensory information (such as noise, light, touch etc.) in school.

All information will be held confidentially (* for further details please see below). I hope that the results of this survey will help educational professionals better understand how to effectively support children in school.

Appendix 2a continued:

Please return questionnaires to your child's school where they will be forwarded to the Educational Psychology Service.

If you have any questions please contact me or my supervisor, Dr Simon Griffey, at the addresses given below. Thank you for your time.

Yours sincerely,

Plum Hutton
Chartered Educational Psychologist.

*Confidential data:

Each child will be allocated a personal identification number so that only the researcher will be able to trace the identity of the child by linking the identification number to a list kept on a secure computer drive at the Educational Psychology Service. When the information from the questionnaires has been entered onto a database it will be anonymised so that it will not be possible to trace the information back to you.

Plum Hutton Educational Psychologist Educational Psychology Service XXXX Telephone Number: XXXX E-mail: XXXX	Dr Simon Griffey, Research Director Doctorate in Educational Psychology Programme School of Psychology Cardiff University Tower Building, Park Place Cardiff, CF10 3AT Tel: 029 208 74007 E-mail: griffeysj@Cardiff.ac.uk
If you have a complaint, please contact: Secretary of the Psychology Ethics Committee, School of Psychology, Cardiff University Tower Building, Park Place Cardiff, CF10 3AT	Tel:029 208 70360 Email: psychethics@cf.ac.uk

Appendix 2b: Parent / Carer Consent Form Group A

School of Psychology, Cardiff University
Parent / Carer Consent Form Group A

I understand that:

- my participation in this project will involve completing a Background Information Sheet and questionnaire about how my child processes sensory information, which will require approximately 10 minutes of my time;
- my child's teacher will also be asked to complete a Background Information Sheet, The Strengths and Difficulties Questionnaire and Sensory Profile Teacher Questionnaire about my child;
- at the end of the study I will be provided with further information about the purpose of the study.
- information provided by me will be held confidentially so that only Plum Hutton can trace this information back to me individually. My data will be anonymised when it has been entered into a database, within 3 weeks of the receipt of the questionnaires. After this point no one will be able to trace my information back to me;
- I can request access to my data or ask for it to be destroyed up until the point when it is anonymised. The anonymous data may be kept indefinitely;
- participation in this study is entirely voluntary;
- I am free to ask any questions at any time and to discuss any concerns with Dr Simon Griffey;
- I understand that participating in this study will **not** result in individual educational psychology assessment for my child;
- The information collected is for research purposes only.

– –

Please return this slip to the school in the envelope provided within two weeks:

Name of Child:

School:

Please tick one box below.

I, ________________________________(NAME)

☐ agree to take part in the study conducted by Plum Hutton of the School of Psychology, Cardiff University with the supervision of Dr Simon Griffey.

☐ do **not** want to take part in this study.

Signed:

Date:

Appendix 2c: SENCo Consent for Group B

School of Psychology, Cardiff University

SENCo Consent Form Group B

Dear SENCo,

I am an Educational Psychologist working in XXXX and studying for a doctorate in Educational Psychology at Cardiff University. I am conducting research into children who experience difficulties processing sensory information. For example, a child might be oversensitive or under-sensitive to touch, noise, movement, taste, texture etc., which may make it more difficult for them to concentrate and learn in school.

I would be grateful if you could complete the following brief, anonymous questionnaire. This will help me to establish the current level of knowledge about Sensory Processing Disorders among SENCos. Please do not be concerned if you feel you have little knowledge in this area. I suspect you will be in good company!

If you have any concerns please contact me or my supervisor at the address below.

Yours sincerely,

Plum Hutton
Chartered Educational Psychologist.

Plum Hutton Educational Psychologist Educational Psychology Service XXXX Telephone Number: XXXX E-mail: XXXX	Dr Simon Griffey, Research Director Doctorate in Educational Psychology Programme School of Psychology, Cardiff University Tower Building, Park Place Cardiff, CF10 3AT Tel: 029 208 74007 E-mail: griffeysj@Cardiff.ac.uk
If you have a complaint, please contact: Secretary of the Psychology Ethics Committee, School of Psychology, Cardiff University Tower Building, Park Place Cardiff, CF10 3AT	Tel:029 208 70360 Email: psychethics@cf.ac.uk

Consent Form.

I understand that:

- my participation in this project will involve completing 1 questionnaire, which will require approximately 3 minutes of my time;
- at the end of the study I will be provided further information about the purposes of the study.
- information provided by me will be held anonymously so that it can not be traced back to me;
- The anonymous data may be kept indefinitely;
- participation in this study is entirely voluntary;
- I am free to ask any questions at any time and to discuss any concerns with Dr Simon Griffey;

By completing this questionnaire I am consenting to take part in the study.

Appendix 3a: Teacher Introductory Letter

School of Psychology
Cardiff University
Tower Building,
Park Place
Cardiff,
CF10 3AT

September 2010

Dear Teacher,

I am an Educational Psychologist working in XXXX and studying for a doctorate in Educational Psychology at Cardiff University. I am doing research into children who experience difficulties processing sensory information. For example, a child might be oversensitive or under-sensitive to touch, noise, movement, taste, texture etc., which may make it more difficult for them to concentrate and learn in school.

This study has the following aims. I hope to find out:

1. How many children with behavioural, emotional or social problems at school also experience sensory issues?
2. Is there a link between children with sensory difficulties and other diagnoses, such as Attention Deficit Hyperactive Disorder or Dyslexia?
3. Do children show a similar pattern of sensory processing at home and at school?
4. How many pupils in the study have been assessed by an occupational therapist?

Please could you spend a few minutes completing the attached questionnaire? It would be helpful if the questionnaire could be completed by the teacher / teaching assistant who knows the child best. Parental consent will be gained prior to you completing the teacher questionnaire.

I hope that the results of this survey will help educational professionals better understand how to effectively support children in school. Please return questionnaires to the SENCo who will forward them to the Educational Psychology Service.

Appendix 3a continued:

If you have any questions please contact me or my supervisor, Dr Simon Griffey, at the addresses given below. Thank you for your time.

Yours sincerely,

Plum Hutton
Chartered Educational Psychologist.

Plum Hutton Educational Psychologist Educational Psychology Service XXXX Telephone Number: XXXX E-mail: XXXX	Dr Simon Griffey, Research Director Doctorate in Educational Psychology Programme School of Psychology, Cardiff University Tower Building, Park Place Cardiff, CF10 3AT Tel: 029 208 74007 E-mail: griffeysj@Cardiff.ac.uk
If you have a complaint, please contact: Secretary of the Psychology Ethics Committee, School of Psychology, Cardiff University Tower Building, Park Place Cardiff, CF10 3AT	Tel:029 208 70360 Email: psychethics@cf.ac.uk

Appendix 3b: Teacher Consent for Group A

School of Psychology, Cardiff University
Teacher Consent Form Group A

I understand that:

- my participation in this project will involve completing 2 questionnaires, which will require approximately 20 minutes of my time;
- the child's parent/s will also be asked to complete a parental questionnaire about how the child processes sensory information;
- at the end of the study I will be provided with further information about the purpose of the study.
- information provided by me will be held confidentially so that only Plum Hutton can trace this information back to me individually. My data will be anonymised when it has been entered into a database, within 3 weeks of the receipt of the data. After this point no one will be able to trace my information back to me;
- I can request access to my data or ask for it to be destroyed up until the point when it is anonymised. The anonymous data may be kept indefinitely;
- participation in this study is entirely voluntary;
- I am free to ask any questions at any time and to discuss any concerns with Dr Simon Griffey;
- I understand that participating in this study will **not** result in individual educational psychology assessment for the child concerned;

– –

Please return this slip to the SENCo within two weeks:

Name of Child:

School:

I, ________________________________(NAME) agree to take part in the study conducted by Plum Hutton of the School of Psychology, Cardiff University with the supervision of Dr Simon Griffey.

Signed:

Date:

Appendix 4:

Guidance for Approaching Parents.

This study involves recruiting parents of children that are considered by the school to have behavioural, emotional or social difficulties (BESD). Some parents may not be fully aware that their child's behaviour at school is potentially concerning and so may be very sensitive about being asked to take part in this research.

The following points should be considered:

- Parents should not be approached when in earshot of other parents. If approaching parents at the end of the school day, they should be taken to a quiet room. It would be best to discuss participation during a pre-arranged parent-teacher meeting.
- It is suggested that in most cases it is not appropriate for the pupil to be present when discussing participation in the research. Staff should either arrange an alternative activity for the pupil to do during the discussion or organize a time to speak to the parents when the pupil is in lessons.
- If the child is known to the Primary Behaviour Support Team or the Educational Psychology Service (for BESD) parents should be informed that all children in the school known to these services are being asked to take part in the research.
- For parents not known to the above services, reasons for including each child in the study should be sensitively explained. It is good practice for schools to keep parents informed of how their child is getting on at school, so in most cases BESD concerns should not be news to the parent.
- Where appropriate, parents should be reassured that inclusion in the research does **not** necessarily suggest that the child presents with challenging and disruptive behaviour in school. This research is also relevant to children who are very shy, withdrawn, anxious, have difficulties making friends etc.
- If you have any concerns about approaching particular parents please contact Plum Hutton, Educational Psychologist, who will be happy to provide support.

Educational Psychology Service
XXXX
Telephone Number: XXXX
E-mail: XXXX

Appendix 5a: End of Study Feedback for Parents

School of Psychology
Cardiff University
Tower Building,
Park Place
Cardiff,
CF10 3AT

September 2010

Dear Parent / Carer,

Thank you for completing the questionnaire about your child's sensory processing. Your participation has contributed towards the body of research knowledge about the links between sensory processing difficulties and children's behaviour in school.

As stated in the introductory letter this study aims to answer the following questions:

1. How many children with behavioural, emotional or social problems at school also experience sensory issues?
2. Is there a link between children with sensory difficulties and other diagnoses, such as Attention Deficit Hyperactive Disorder or Dyslexia? (NB. Please note that I am **not** suggesting that your child might have another diagnosis.)
3. Do children show a similar pattern of sensory processing at home and at school?

To date, there is very little published research into sensory processing difficulties in the United Kingdom and world wide there has been very little research into the impact of sensory processing difficulties in the field of education. It is hoped that this research will indicate whether sensory processing difficulties are common amongst children identified as having behavioural, emotional or social difficulties at school. If many children in this sample are found to have sensory sensitivities, it will indicate that sensory issues should be routinely considered when supporting children with behavioural, emotional and social difficulties in school.

If you have any questions please contact me or my supervisor, Dr Simon Griffey, at the addresses overleaf. Thank you for your time.

Yours sincerely,

Plum Hutton
Chartered Educational Psychologist.

Appendix 5a continued:

Plum Hutton Educational Psychologist Educational Psychology Service XXXX Telephone Number: XXXX E-mail: XXXX	Dr Simon Griffey, Research Director Doctorate in Educational Psychology Programme School of Psychology Cardiff University Tower Building, Park Place Cardiff, CF10 3AT Tel: 029 208 74007 E-mail: griffeysj@Cardiff.ac.uk
If you have a complaint, please contact: Secretary of the Psychology Ethics Committee, School of Psychology Cardiff University Tower Building, Park Place Cardiff, CF10 3AT	Tel:029 208 70360 Email: psychethics@cf.ac.uk

Appendix 5b: End of study Feedback for SENCOs

School of Psychology
Cardiff University
Tower Building,
Park Place
Cardiff,
CF10 3AT

September 2010

Dear SENCo,

In September 2010 you were given a short questionnaire (by your link Educational Psychologist) about your knowledge of sensory processing difficulties. Thank you for your time if you have completed and returned this questionnaire. If you have not completed the questionnaire, but would like to do so, I have included another copy with this letter.

The purpose of this letter is to thank SENCos for their involvement and to provide you with additional information about the aims of my research. The SENCo questionnaire is part of a larger study which is investigating the following questions:

1. How many children with behavioural, emotional or social problems at school also experience sensory issues?
2. If there is a link between children with sensory difficulties and other diagnoses, such as Attention Deficit Hyperactive Disorder or Dyslexia?
3. Do children show a similar pattern of sensory processing at home and at school?
4. What is the current level of knowledge of SENCos about sensory processing difficulties in schools?

To date, there is very little published research into sensory processing difficulties in the United Kingdom and world wide there has been very little research into the impact of sensory processing difficulties in the field of education. It is hoped that this research will indicate whether sensory processing difficulties are common amongst children identified as having behavioural, emotional or social difficulties (BESD) at school. If many children in this sample are found to have sensory sensitivities, it will indicate that sensory issues should be routinely considered when supporting children with BESD in school. The SENCo questionnaire will help to establish the current level of knowledge about sensory issues in school and whether future teacher training might be beneficial.

Participation in this research will contribute towards the body of research knowledge about the links between sensory processing difficulties and children's behaviour in school. Once again I would like to thank all SENCos who have found the time to support this endeavour.

Appendix 5b continued:

If you have any questions please contact me or my supervisor, Dr Simon Griffey, at the addresses below.

Yours sincerely,

Plum Hutton
Chartered Educational Psychologist.

<table>
<tr><td>Plum Hutton
Educational Psychologist

Educational Psychology Service
XXXX

Telephone Number: XXXX
E-mail: XXXX</td><td>Dr Simon Griffey, Research Director
Doctorate in Educational Psychology Programme
School of Psychology
Cardiff University
Tower Building, Park Place
Cardiff, CF10 3AT
Tel: 029 208 74007
E-mail: griffeysj@Cardiff.ac.uk</td></tr>
<tr><td>If you have a complaint, please contact:
Secretary of the Psychology Ethics Committee,
School of Psychology
Cardiff University
Tower Building, Park Place
Cardiff,
CF10 3AT</td><td>Tel:029 208 70360
Email: psychethics@cf.ac.uk</td></tr>
</table>

Appendix 6:

Associations with Background Factors that have a Frequency of < 15.

Appendix 6 provides the results for background factors where less than 15 children were rated as having the background difficulty (e.g. ASD or ADHD). Person's chi-square test was used to analyse the data. While some significant associations were found it was decided that, due to the small numbers of children involved, it would not be appropriate to draw wider conclusions about associations between SPDs and other factors from the results below.

Ap.6.1 Factors with No Associations

A number of factors showed no associations with any SDQ or Sensory Measures as shown in Table Ap.6.1 below.

Table Ap.6.1:

Background factors where no associations were found with SDQ or sensory measures.

Background Factor/Difficulty	Rated by Teacher or Parent	N children rated as having the background factor or difficulty
Premature birth	Parent	11
Child know to have attachment difficulties	Teacher	11
Dyslexia	Parent	6
Dyslexia	Teacher	3

Very few pupils were rated as having dyslexia on the two dyslexia measures, so Fisher's exact test was used to analyse results where more than 25% of the cells had an expected frequency of less than 5. No significant associations were found.

Appendix 6 continued:

Ap.6.2 Associations with SSP and SC Total Scores.

Associations were found between four background factors and Total Scores on the SSP and/or SC.

Table Ap.6.2:

Significant Associations between Background Factors and 'Total Scores' on the SSP and SC.

Background Factor	N	% of Total		**SSP Total (Parent)**	**SC Total (School)**
N with difficulties on Sensory Total Score				72	64
ASD diagnosis (Parent)	10	8	**x^2=**	9.54	9.61
			p	<.005	<.005
ASD Diagnosis (Teacher)	9	7	**x^2=**	Fisher's	13.39
			p	<.01	<.001
ADHD diagnosis (Parent)	9	7	**x^2=**	Fisher's	4.66
			p	*ns	<.05
DCD Diagnosis (Parent)	4	3	**x^2=**	Fisher's	Fisher's
			p	*ns	<.05*

Notes: ns = non-significant. Non-significant results are shaded. Results were reported as significant if p<.05. For all calculations, degrees of freedom = 1. *Fisher's exact test was used when more than 25% of the 'expected count' cells on the chi-square test was <5.

Only 2 background factors, ASD diagnosis (Teacher & Parent) showed significant associations with the Total Score on both the parent and teacher sensory measures. This is commensurate with previous research that has associated SPDs with ASD (Tomchek & Dunn, 2007; Baranek, 2002; Ermer & Dunn 1998; Dawson & Watling, 2000; Watling, Deitz & White, 2001).

Appendix 6 continued:

Ap.6.3 Associations with SSP Subscales

Table Ap.6.3 shows associations between background factors and individual subscales on the SSP.

Table Ap.6.3

Associations between SSP subscales and children rated as having difficulties in background factors.

Background Factor	N		SSP Seeks Sensation	SSP Auditory	SSP Tactile	SSP Taste	SSP Low Energy/ Weak	SSP Move -ment	SSP Visual & Auditory
N			94	92	40	40	40	33	30
Attachment diffs. (Parent)	11	**x^2=**	1.13	3.15	4.72	.001	1.69	6.31	4.72
		p	=ns	=ns	<.05	=ns	=ns	<.05	<.05
ASD diagnosis (Parent)	10	**x^2=**	0.66	2.57	0.86	5.02	2.52	1.97	2.99
		p	=ns	=ns	=ns	<.05	=ns	=ns	=ns
ASD diagnosis (Teacher)	9	**x^2=**	1.55	1.74	1.04	5.71	1.18	2.12	6.69
		p	=ns	=ns	=ns	<.05	=ns	=ns	<.05
ADHD diagnosis (Teacher)	8	**x^2=**	3.77	1.38	4.61	0.23	0.07	0.86	1.60
		p	=ns	=ns	<.05	=ns	=ns	=ns	=ns

Note: ns = non-significant. Non-significant results are shaded. Results were reported as significant if p<.05For all calculations, degrees of freedom = 1.

Despite significant associations between ‘ASD diagnosis’ and SSP Total Scores, there were only significant associations between three SSP subscales and ‘ASD diagnosis’ (both parent and teacher).

Appendix 6 continued:

Ap.6.4 Associations with SC Subscales.

Associations between background factors and individual subscales on the SC were analysed using Pearson's chi-square test and where appropriate Fisher's exact test. The results are shown in the table below.

Table Ap.6.4

Associations between SC Subscales and Children Rated as Having Difficulties in Background Factors.

Background Factor	N, back-ground issue		SC Movement	SC Classroom Behaviour	SC Touch	SC Auditory	SC Visual
N - difficulties on SC subscales			85	80	75	52	36
ASD Diagnosis (Parent)	10	**x^2=**	4.12	2.28	3.51	6.11	1.58
		p	<.05	ns	ns	<.05	ns
ASD Diagnosis (Teacher)	9	**x^2=**	4.09	4.66	6.42	14.50	1.46
		p	<.05	<.05	<.05	<.001	ns
ADHD Diagnosis (Parent)	9	**x^2=**	0.07	3.95	Fisher's	1.76	5.02
		p	ns	<.05	ns*	ns	<.05
DCD Diagnosis (Parent)	4	**x^2=**	Fisher's	Fisher's	Fisher's	Fisher's	Fisher's
		p	ns*	ns*	ns*	ns*	<.05*
DCD Diagnosis (Teacher)	3	**x^2=**	Fisher's	Fisher's	Fisher's	Fisher's	Fisher's
		p	ns*	ns*	ns*	<.05	ns*

Note: ns = non-significant. Non-significant results are shaded. Results were reported as significant if p<.05. For all calculations, degrees of freedom = 1. *Fisher's exact test was used when more than 25% of the 'expected count' cells on the chi-square test was <5.

The only background factor with more than 2 significant associations was the ASD diagnosis (Teacher), which is unsurprising as links between sensory difficulties and ASD are well documented.

Appendix 6 continued:

Ap.6.5 Associations with SC School Factors

Analysis of the associations between background factors and school factors on the SC are presented in the table below.

Table Ap.6.5

Associations between SC School Factor subscales and children rated as having difficulties in background factors.

Background Factor	N		School Companion School Factors			
			Tolerance for sensory input	Sensory seeking / Registration	Availability for learning	Attention & Awareness
N -difficulties on SC subscales			76	75	46	23
ASD diagnosis (Parent)	10	**x^2 =**	6.42	1.60	3.94	1.25
		p	<.05	ns	<.05	ns
ASD Diagnosis (Teacher)	9	**x^2 =**	9.58	3.52	4.23	4.69
		p	<.005	ns	<.05	<.05
ADHD Diagnosis (Parent)	9	**x^2 =**	Fisher's	0.09	0.42	4.58
		p	ns*	ns	ns	<.05

Note: ns = non-significant. Non-significant results are shaded. Results were reported as significant if $p<.05$. For all calculations, degrees of freedom = 1. *Fisher's exact test was used when more than 25% of the 'expected count' cells on the chi-square test was <5.

Like the analysis of other SC subscales and background factors there is no clear pattern of association except for the ASD diagnosis (Teacher).

Appendix 7a

Frequency Tables for Comparisons of Parental and Teacher Scores on the SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC=	Sensory Profile, School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

SSP Auditory Difficulties or Not * SC Auditory Difficulties Crosstabulation

			SC Auditory		
			Typical & PD	DD	Total
SSP Auditory	Typical & PD	Count	32	9	41
		Expected Count	25.3	15.7	41.0
		% within P Aud Not DD	78.0%	22.0%	100.0%
		% within T Aud Not DD	39.0%	17.6%	30.8%
		% of Total	24.1%	6.8%	30.8%
	DD	Count	50	42	92
		Expected Count	56.7	35.3	92.0
		% within P Aud Not DD	54.3%	45.7%	100.0%
		% within T Aud Not DD	61.0%	82.4%	69.2%
		% of Total	37.6%	31.6%	69.2%
Total		Count	82	51	133
		Expected Count	82.0	51.0	133.0
		% within P Aud Not DD	61.7%	38.3%	100.0%
		% within T Aud Not DD	100.0%	100.0%	100.0%
		% of Total	61.7%	38.3%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.739[a]	1	.009		
Continuity Correction[b]	5.773	1	.016		
Likelihood Ratio	7.086	1	.008		
Fisher's Exact Test				.012	.007
Linear-by-Linear Association	6.688	1	.010		
N of Valid Cases	133				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.72.

b. Computed only for a 2x2 table

Appendix 7a continued:

SSP Movement Difficulties or Not * SC Movement Difficulties Crosstabulation

			SC Movement Not DD		
			Typical & PD	DD	Total
SSP Movement	Typical & PD	Count	46	56	102
		Expected Count	41.6	60.4	102.0
		% within P Move Not DD	45.1%	54.9%	100.0%
		% within T Move Not DD	83.6%	70.0%	75.6%
		% of Total	34.1%	41.5%	75.6%
	DD	Count	9	24	33
		Expected Count	13.4	19.6	33.0
		% within P Move Not DD	27.3%	72.7%	100.0%
		% within T Move Not DD	16.4%	30.0%	24.4%
		% of Total	6.7%	17.8%	24.4%
Total		Count	55	80	135
		Expected Count	55.0	80.0	135.0
		% within P Move Not DD	40.7%	59.3%	100.0%
		% within T Move Not DD	100.0%	100.0%	100.0%
		% of Total	40.7%	59.3%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.281[a]	1	.070		
Continuity Correction[b]	2.585	1	.108		
Likelihood Ratio	3.400	1	.065		
Fisher's Exact Test				.102	.052
Linear-by-Linear Association	3.257	1	.071		
N of Valid Cases	135				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.44.

b. Computed only for a 2x2 table

Appendix 7a continued:

SSP Tactile Difficulties or Not * SC Tactile Difficulties Crosstabulation

			SC Tactile		Total
			Typical & PD	DD	
SSP Tactile	Typical & PD	Count	51	43	94
		Expected Count	45.6	48.4	94.0
		% within P Tactile Not DD	54.3%	45.7%	100.0%
		% within T Touch Not DD	78.5%	62.3%	70.1%
		% of Total	38.1%	32.1%	70.1%
	DD	Count	14	26	40
		Expected Count	19.4	20.6	40.0
		% within P Tactile Not DD	35.0%	65.0%	100.0%
		% within T Touch Not DD	21.5%	37.7%	29.9%
		% of Total	10.4%	19.4%	29.9%
Total		Count	65	69	134
		Expected Count	65.0	69.0	134.0
		% within P Tactile Not DD	48.5%	51.5%	100.0%
		% within T Touch Not DD	100.0%	100.0%	100.0%
		% of Total	48.5%	51.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.165[a]	1	.041		
Continuity Correction[b]	3.430	1	.064		
Likelihood Ratio	4.218	1	.040		
Fisher's Exact Test				.058	.032
Linear-by-Linear Association	4.134	1	.042		
N of Valid Cases	134				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.40.

b. Computed only for a 2x2 table

Appendix 7a continued:

SSP Sensory Seeking Difficulties * SC SF1 Seeking/Registration Difficulties or Not Crosstabulation

			SC SF1 Seeking /Registration		Total
			Typical & PD	DD	
P Seeking Not DD	Typical & PD	Count	27	14	41
		Expected Count	19.4	21.6	41.0
		% within P Under Not DD	65.9%	34.1%	100.0%
		% within T SF1 SeekReg Not DD	42.2%	19.7%	30.4%
		% of Total	20.0%	10.4%	30.4%
	DD	Count	37	57	94
		Expected Count	44.6	49.4	94.0
		% within P Under Not DD	39.4%	60.6%	100.0%
		% within T SF1 SeekReg Not DD	57.8%	80.3%	69.6%
		% of Total	27.4%	42.2%	69.6%
Total		Count	64	71	135
		Expected Count	64.0	71.0	135.0
		% within P Under Not DD	47.4%	52.6%	100.0%
		% within T SF1 SeekReg Not DD	100.0%	100.0%	100.0%
		% of Total	47.4%	52.6%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.036[a]	1	.005		
Continuity Correction[b]	7.009	1	.008		
Likelihood Ratio	8.119	1	.004		
Fisher's Exact Test				.005	.004
Linear-by-Linear Association	7.976	1	.005		
N of Valid Cases	135				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.44.

b. Computed only for a 2x2 table

Appendix 7a continued:

SSP Visual/Auditory Difficulties or Not * SC Visual Difficulties Crosstabulation

			SC Visual		Total
			Typical & PD	DD	
SSP Visual/ Auditory	Typical & PD	Count	77	26	103
		Expected Count	75.1	27.9	103.0
		% within P VisAud Not DD	74.8%	25.2%	100.0%
		% within T Vis Not DD	79.4%	72.2%	77.4%
		% of Total	57.9%	19.5%	77.4%
	DD	Count	20	10	30
		Expected Count	21.9	8.1	30.0
		% within P VisAud Not DD	66.7%	33.3%	100.0%
		% within T Vis Not DD	20.6%	27.8%	22.6%
		% of Total	15.0%	7.5%	22.6%
Total		Count	97	36	133
		Expected Count	97.0	36.0	133.0
		% within P VisAud Not DD	72.9%	27.1%	100.0%
		% within T Vis Not DD	100.0%	100.0 %	100.0%
		% of Total	72.9%	27.1%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.770[a]	1	.380		
Continuity Correction[b]	.415	1	.519		
Likelihood Ratio	.748	1	.387		
Fisher's Exact Test				.484	.256
Linear-by-Linear Association	.765	1	.382		
N of Valid Cases	133				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.12.

b. Computed only for a 2x2 table

Appendix 7a continued:

SSP Total Difficulties or Not * SC Total Difficulties or Not Crosstabulation

			SC Total Diffs		Total
			Typical & PD	DD	
SSP Total Difficulties	Typical & PD	Count	42	17	59
		Expected Count	32.4	26.6	59.0
		% within P Total Not DD	71.2%	28.8%	100.0%
		% within T Total Not DD	58.3%	28.8%	45.0%
		% of Total	32.1%	13.0%	45.0%
	DD	Count	30	42	72
		Expected Count	39.6	32.4	72.0
		% within P Total Not DD	41.7%	58.3%	100.0%
		% within T Total Not DD	41.7%	71.2%	55.0%
		% of Total	22.9%	32.1%	55.0%
Total		Count	72	59	131
		Expected Count	72.0	59.0	131.0
		% within P Total Not DD	55.0%	45.0%	100.0%
		% within T Total Not DD	100.0%	100.0%	100.0%
		% of Total	55.0%	45.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	11.416[a]	1	.001		
Continuity Correction[b]	10.254	1	.001		
Likelihood Ratio	11.653	1	.001		
Fisher's Exact Test				.001	.001
Linear-by-Linear Association	11.328	1	.001		
N of Valid Cases	131				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.57.
b. Computed only for a 2x2 table

Appendix 7a continued:

SSP Assessed by an Occupational Therapist or Not * SC Assessed by an OT or Not Crosstabulation

			SC OT assessment		Total
			no or Not sure	Yes	
SSP OT assessment	no or Not sure	Count	91	3	94
		Expected Count	82.1	11.9	94.0
		% within PB5 OT recode	96.8%	3.2%	100.0%
		% within TB3 OT recode	82.7%	18.8%	74.6%
		% of Total	72.2%	2.4%	74.6%
	Yes	Count	19	13	32
		Expected Count	27.9	4.1	32.0
		% within PB5 OT recode	59.4%	40.6%	100.0%
		% within TB3 OT recode	17.3%	81.3%	25.4%
		% of Total	15.1%	10.3%	25.4%
Total		Count	110	16	126
		Expected Count	110.0	16.0	126.0
		% within PB5 OT recode	87.3%	12.7%	100.0%
		% within TB3 OT recode	100.0%	100.0 %	100.0%
		% of Total	87.3%	12.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	30.176[a]	1	.000		
Continuity Correction[b]	26.893	1	.000		
Likelihood Ratio	26.113	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	29.936	1	.000		
N of Valid Cases	126				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.06.
b. Computed only for a 2x2 table

Appendix 7b

Frequency Tables for Associations between Parental Background Factor 2 (Fussy Baby) and SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC	Sensory Profile School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

PB3 Fussy Baby * SSP Tactile Difficulties

Crosstab

			SSP Tactile Not DD		
			Typical & PD	DD	Total
PB3 Fussy baby	no or Not sure	Count	73	15	88
		Expected Count	63.6	24.4	88.0
	Yes	Count	21	21	42
		Expected Count	30.4	11.6	42.0
Total		Count	94	36	130
		Expected Count	94.0	36.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	15.420[a]	1	.000	.000	.000	
Continuity Correction[b]	13.818	1	.000			
Likelihood Ratio	14.819	1	.000	.000	.000	
Fisher's Exact Test				.000	.000	
Linear-by-Linear Association	15.301[c]	1	.000	.000	.000	.000
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.63.
b. Computed only for a 2x2 table
c. The standardized statistic is 3.912.

Appendix 7b continued:
PB3 Fussy Baby * SSP Taste Difficulties

Crosstab

			P Taste Not DD		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	71	17	88
		Expected Count	62.3	25.7	88.0
	Yes	Count	21	21	42
		Expected Count	29.7	12.3	42.0
Total		Count	92	38	130
		Expected Count	92.0	38.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	12.938[a]	1	.000	.000	.000	
Continuity Correction[b]	11.497	1	.001			
Likelihood Ratio	12.487	1	.000	.001	.000	
Fisher's Exact Test				.001	.000	
Linear-by-Linear Association	12.838[c]	1	.000	.000	.000	.000
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.28.
b. Computed only for a 2x2 table
c. The standardized statistic is 3.583.

Appendix 7b continued:

PB3 Fussy Baby * SSP Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
PB3 Fussy Baby	no or Not sure	Count	70	18	88
		Expected Count	67.2	20.8	88.0
	Yes	Count	30	13	43
		Expected Count	32.8	10.2	43.0
Total		Count	100	31	131
		Expected Count	100.0	31.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.529[a]	1	.216	.274	.154	
Continuity Correction[b]	1.035	1	.309			
Likelihood Ratio	1.489	1	.222	.274	.154	
Fisher's Exact Test				.274	.154	
Linear-by-Linear Association	1.517[c]	1	.218	.274	.154	.080
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.18.
b. Computed only for a 2x2 table
c. The standardized statistic is 1.232.

Appendix 7b continued:

PB3 Fussy Baby * SSP Seeks Sensation

Crosstab

			SSP Seeks Sensation		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	33	56	89
		Expected Count	27.2	61.8	89.0
	Yes	Count	7	35	42
		Expected Count	12.8	29.2	42.0
Total		Count	40	91	131
		Expected Count	40.0	91.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.605[a]	1	.018	.025	.013	
Continuity Correction[b]	4.684	1	.030			
Likelihood Ratio	5.999	1	.014	.025	.013	
Fisher's Exact Test				.025	.013	
Linear-by-Linear Association	5.562[c]	1	.018	.025	.013	.009
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.82.
b. Computed only for a 2x2 table
c. The standardized statistic is 2.358.

Appendix 7b continued:

PB3 Fussy Baby * SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
PB3 Fussy Baby	no or Not sure	Count	34	54	88
		Expected Count	28.0	60.0	88.0
	Yes	Count	7	34	41
		Expected Count	13.0	28.0	41.0
Total		Count	41	88	129
		Expected Count	41.0	88.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.998[a]	1	.014	.015	.011	
Continuity Correction[b]	5.045	1	.025			
Likelihood Ratio	6.421	1	.011	.015	.011	
Fisher's Exact Test				.015	.011	
Linear-by-Linear Association	5.952[c]	1	.015	.015	.011	.008
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.03.
b. Computed only for a 2x2 table
c. The standardized statistic is 2.440.

Appendix 7b continued:

PB3 Fussy Baby * SSP Low Energy/Weak Difficulties

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
PB3 Fussy Baby	no or Not sure	Count	67	20	87
		Expected Count	62.0	25.0	87.0
	Yes	Count	25	17	42
		Expected Count	30.0	12.0	42.0
Total		Count	92	37	129
		Expected Count	92.0	37.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.235[a]	1	.040	.060	.033	
Continuity Correction[b]	3.423	1	.064			
Likelihood Ratio	4.113	1	.043	.060	.033	
Fisher's Exact Test				.060	.033	
Linear-by-Linear Association	4.202[c]	1	.040	.060	.033	.021
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.05.
b. Computed only for a 2x2 table
c. The standardized statistic is 2.050.

Appendix 7b continued:

PB3 Fussy Baby * SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		Total
			Typical & PD	DD	
PB3 Fussy Baby	no or Not sure	Count	76	12	88
		Expected Count	69.6	18.4	88.0
	Yes	Count	26	15	41
		Expected Count	32.4	8.6	41.0
Total		Count	102	27	129
		Expected Count	102.0	27.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	8.901[a]	1	.003	.005	.004	
Continuity Correction[b]	7.568	1	.006			
Likelihood Ratio	8.410	1	.004	.005	.004	
Fisher's Exact Test				.005	.004	
Linear-by-Linear Association	8.832[c]	1	.003	.005	.004	.003
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.58.
b. Computed only for a 2x2 table
c. The standardized statistic is 2.972.

Appendix 7b continued:

PB3 Fussy Baby * SSP Total Difficulties Score

Crosstab

			SSP Total Difficulties		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	47	39	86
		Expected Count	40.0	46.0	86.0
	Yes	Count	12	29	41
		Expected Count	19.0	22.0	41.0
Total		Count	59	68	127
		Expected Count	59.0	68.0	127.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.191[a]	1	.007	.008	.006	
Continuity Correction[b]	6.207	1	.013			
Likelihood Ratio	7.373	1	.007	.008	.006	
Fisher's Exact Test				.008	.006	
Linear-by-Linear Association	7.135[c]	1	.008	.008	.006	.004
N of Valid Cases	127					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.05.
b. Computed only for a 2x2 table
c. The standardized statistic is 2.671.

Appendix 7b continued:

PB3 Fussy Baby * SC Auditory Difficulties

Crosstab

			SC Auditory Not DD		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	59	30	89
		Expected Count	56.0	33.0	89.0
	Yes	Count	24	19	43
		Expected Count	27.0	16.0	43.0
Total		Count	83	49	132
		Expected Count	83.0	49.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.364[a]	1	.243	.255	.165	
Continuity Correction[b]	.952	1	.329			
Likelihood Ratio	1.350	1	.245	.255	.165	
Fisher's Exact Test				.255	.165	
Linear-by-Linear Association	1.353[c]	1	.245	.255	.165	.077
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.96.
b. Computed only for a 2x2 table
c. The standardized statistic is 1.163.

Appendix 7b continued:

PB3 Fussy Baby * SC Visual Difficulties

Crosstab

			SC Visual Difficulties		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	67	22	89
		Expected Count	66.1	22.9	89.0
	Yes	Count	31	12	43
		Expected Count	31.9	11.1	43.0
Total		Count	98	34	132
		Expected Count	98.0	34.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.154[a]	1	.695	.832	.424	
Continuity Correction[b]	.032	1	.857			
Likelihood Ratio	.153	1	.696	.832	.424	
Fisher's Exact Test				.678	.424	
Linear-by-Linear Association	.153[c]	1	.696	.832	.424	.154
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.08.
b. Computed only for a 2x2 table
c. The standardized statistic is .391.

Appendix 7b continued:

PB3 Fussy Baby * SC Movement Difficulties

Crosstab

			SC Movement Difficulties		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	32	57	89
		Expected Count	35.7	53.3	89.0
	Yes	Count	21	22	43
		Expected Count	17.3	25.7	43.0
Total		Count	53	79	132
		Expected Count	53.0	79.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.002[a]	1	.157	.186	.110	
Continuity Correction[b]	1.502	1	.220			
Likelihood Ratio	1.986	1	.159	.186	.110	
Fisher's Exact Test				.186	.110	
Linear-by-Linear Association	1.987[c]	1	.159	.186	.110	.056
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.27.
b. Computed only for a 2x2 table
c. The standardized statistic is -1.410.

Appendix 7b continued:

PB3 Fussy Baby * SC Tactile Difficulties

Crosstab

			SC Tactile Difficulties		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	42	47	89
		Expected Count	42.5	46.5	89.0
	Yes	Count	21	22	43
		Expected Count	20.5	22.5	43.0
Total		Count	63	69	132
		Expected Count	63.0	69.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.031[a]	1	.859	1.000	.503	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.031	1	.859	1.000	.503	
Fisher's Exact Test				1.000	.503	
Linear-by-Linear Association	.031[c]	1	.860	1.000	.503	.145
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.52.
b. Computed only for a 2x2 table
c. The standardized statistic is -.177.

Appendix 7b continued:

PB3 Fussy Baby * SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		Total
			Typical & PD	DD	
PB3 Fussy Baby	no or Not sure	Count	37	52	89
		Expected Count	37.8	51.2	89.0
	Yes	Count	19	24	43
		Expected Count	18.2	24.8	43.0
Total		Count	56	76	132
		Expected Count	56.0	76.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.081[a]	1	.776	.852	.460	
Continuity Correction[b]	.009	1	.923			
Likelihood Ratio	.081	1	.776	.852	.460	
Fisher's Exact Test				.852	.460	
Linear-by-Linear Association	.080[c]	1	.777	.852	.460	.143
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.24.
b. Computed only for a 2x2 table
c. The standardized statistic is -.284.

Appendix 7b continued:

PB3 Fussy Baby * SC School Factor 1 Seeking/Registration Difficulties

Crosstab

			SC Seeking/Registration		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	41	48	89
		Expected Count	41.8	47.2	89.0
	Yes	Count	21	22	43
		Expected Count	20.2	22.8	43.0
Total		Count	62	70	132
		Expected Count	62.0	70.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.089[a]	1	.765	.853	.455	
Continuity Correction[b]	.013	1	.910			
Likelihood Ratio	.089	1	.765	.853	.455	
Fisher's Exact Test				.853	.455	
Linear-by-Linear Association	.089[c]	1	.766	.853	.455	.141
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.20.
b. Computed only for a 2x2 table
c. The standardized statistic is -.298.

Appendix 7b continued:

PB3 Fussy Baby * SC School Factor 2 Attention & Awareness Difficulties

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
PB3 Fussy Baby	no or Not sure	Count	74	15	89
		Expected Count	74.2	14.8	89.0
	Yes	Count	36	7	43
		Expected Count	35.8	7.2	43.0
Total		Count	110	22	132
		Expected Count	110.0	22.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.007[a]	1	.934	1.000	.573	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.007	1	.934	1.000	.573	
Fisher's Exact Test				1.000	.573	
Linear-by-Linear Association	.007[c]	1	.934	1.000	.573	.196
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.17.
b. Computed only for a 2x2 table
c. The standardized statistic is -.083.

Appendix 7b continued:

PB3 Fussy Baby * SC School Factor 3 Tolerance for Sensory Input

Crosstab

			SC SF3 Tolerance		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	41	48	89
		Expected Count	41.8	47.2	89.0
	Yes	Count	21	22	43
		Expected Count	20.2	22.8	43.0
Total		Count	62	70	132
		Expected Count	62.0	70.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.089[a]	1	.765	.853	.455	
Continuity Correction[b]	.013	1	.910			
Likelihood Ratio	.089	1	.765	.853	.455	
Fisher's Exact Test				.853	.455	
Linear-by-Linear Association	.089[c]	1	.766	.853	.455	.141
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.20.
b. Computed only for a 2x2 table
c. The standardized statistic is -.298.

Appendix 7b continued:

PB3 Fussy Baby * SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		Total
			Typical & PD	DD	
PB3 Fussy Baby	no or Not sure	Count	58	31	89
		Expected Count	60.7	28.3	89.0
	Yes	Count	32	11	43
		Expected Count	29.3	13.7	43.0
Total		Count	90	42	132
		Expected Count	90.0	42.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.143[a]	1	.285	.324	.193	
Continuity Correction[b]	.757	1	.384			
Likelihood Ratio	1.169	1	.280	.324	.193	
Fisher's Exact Test				.324	.193	
Linear-by-Linear Association	1.135[c]	1	.287	.324	.193	.092
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.68.
b. Computed only for a 2x2 table
c. The standardized statistic is -1.065.

Appendix 7b continued:

PB3 Fussy Baby * SC Total Difficulties

Crosstab

			SC Total Difficulties		
			Typical & PD	DD	Total
PB3 Fussy Baby	no or Not sure	Count	47	42	89
		Expected Count	48.5	40.5	89.0
	Yes	Count	25	18	43
		Expected Count	23.5	19.5	43.0
Total		Count	72	60	132
		Expected Count	72.0	60.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.332[a]	1	.564	.582	.349	
Continuity Correction[b]	.152	1	.697			
Likelihood Ratio	.333	1	.564	.582	.349	
Fisher's Exact Test				.582	.349	
Linear-by-Linear Association	.330[c]	1	.566	.582	.349	.126
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.55.
b. Computed only for a 2x2 table
c. The standardized statistic is -.574.

Appendix 7c

Frequency Tables for Associations between Parental Background Factor 4 (Parental Rating of the Child's Anxiety) and SSP and SC Subscales.

Key:

P=	Parental	T=	Teacher
SSP=	Short Sensory Profile		
SC	Sensory Profile School Companion		
PD=	Probable Difference (i.e. Probable difficulties)		
DD=	Definite Difference (i.e. Difficulties)		

PB4 Anxiety * SSP Tactile Difficulties

Crosstab

			SSP Tactile Difficulties		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	60	8	68
		Expected Count	49.2	18.8	68.0
	Yes	Count	34	28	62
		Expected Count	44.8	17.2	62.0
Total		Count	94	36	130
		Expected Count	94.0	36.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	18.064[a]	1	.000	.000	.000	
Continuity Correction[b]	16.435	1	.000			
Likelihood Ratio	18.777	1	.000	.000	.000	
Fisher's Exact Test				.000	.000	
Linear-by-Linear Association	17.925[c]	1	.000	.000	.000	.000
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.17.

b. Computed only for a 2x2 table

c. The standardized statistic is 4.234.

Appendix 7c continued:

PB4 Anxiety * SSP Taste Difficulties

Crosstab

			SSP Taste Difficulties		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	54	14	68
		Expected Count	48.1	19.9	68.0
	Yes	Count	38	24	62
		Expected Count	43.9	18.1	62.0
Total		Count	92	38	130
		Expected Count	92.0	38.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.148[a]	1	.023	.033	.019	
Continuity Correction[b]	4.309	1	.038			
Likelihood Ratio	5.183	1	.023	.033	.019	
Fisher's Exact Test				.033	.019	
Linear-by-Linear Association	5.109[c]	1	.024	.033	.019	.012
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.12.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.260.

Appendix 7c continued:

PB4 Anxiety * P Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	59	10	69
		Expected Count	52.7	16.3	69.0
	Yes	Count	41	21	62
		Expected Count	47.3	14.7	62.0
Total		Count	100	31	131
		Expected Count	100.0	31.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.789[a]	1	.009	.013	.008	
Continuity Correction[b]	5.758	1	.016			
Likelihood Ratio	6.873	1	.009	.013	.008	
Fisher's Exact Test				.013	.008	
Linear-by-Linear Association	6.737[c]	1	.009	.013	.008	.006
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.67.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.596.

Appendix 7c continued:

PB4 Anxiety * SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks Sensation		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	24	45	69
		Expected Count	21.1	47.9	69.0
	Yes	Count	16	46	62
		Expected Count	18.9	43.1	62.0
Total		Count	40	91	131
		Expected Count	40.0	91.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.240[a]	1	.265	.342	.178	
Continuity Correction[b]	.853	1	.356			
Likelihood Ratio	1.248	1	.264	.342	.178	
Fisher's Exact Test				.342	.178	
Linear-by-Linear Association	1.231[c]	1	.267	.342	.178	.082
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.93.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.110.

Appendix 7c continued:

PB4 Anxiety * SSP Auditory Difficulties

Crosstab

			SSP Auditory		
			Typical & PD	DD	Total
PB4 Anxiety	no or Not sure	Count	31	37	68
		Expected Count	21.6	46.4	68.0
	Yes	Count	10	51	61
		Expected Count	19.4	41.6	61.0
Total		Count	41	88	129
		Expected Count	41.0	88.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	12.641[a]	1	.000	.001	.000	
Continuity Correction[b]	11.330	1	.001			
Likelihood Ratio	13.141	1	.000	.001	.000	
Fisher's Exact Test				.001	.000	
Linear-by-Linear Association	12.543[c]	1	.000	.001	.000	.000
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.39.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.542.

Appendix 7c continued:

PB4 Anxiety * SSP Low Energy

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	55	13	68
		Expected Count	48.5	19.5	68.0
	Yes	Count	37	24	61
		Expected Count	43.5	17.5	61.0
Total		Count	92	37	129
		Expected Count	92.0	37.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.431[a]	1	.011	.012	.009	
Continuity Correction[b]	5.480	1	.019			
Likelihood Ratio	6.485	1	.011	.019	.009	
Fisher's Exact Test				.019	.009	
Linear-by-Linear Association	6.381[c]	1	.012	.012	.009	.006
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.50.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.526.

Appendix 7c continued:

PB4 Anxiety * SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	61	6	67
		Expected Count	53.0	14.0	67.0
	Yes	Count	41	21	62
		Expected Count	49.0	13.0	62.0
Total		Count	102	27	129
		Expected Count	102.0	27.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	12.079[a]	1	.001	.001	.000	
Continuity Correction[b]	10.621	1	.001			
Likelihood Ratio	12.579	1	.000	.001	.000	
Fisher's Exact Test				.001	.000	
Linear-by-Linear Association	11.986[c]	1	.001	.001	.000	.000
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.98.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.462.

Appendix 7c continued:

PB4 Anxiety * SSP Total Difficulties Score

Crosstab

			SSP Total Dificulties		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	42	25	67
		Expected Count	31.1	35.9	67.0
	Yes	Count	17	43	60
		Expected Count	27.9	32.1	60.0
Total		Count	59	68	127
		Expected Count	59.0	68.0	127.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	15.018[a]	1	.000	.000	.000	
Continuity Correction[b]	13.668	1	.000			
Likelihood Ratio	15.371	1	.000	.000	.000	
Fisher's Exact Test				.000	.000	
Linear-by-Linear Association	14.899[c]	1	.000	.000	.000	.000
N of Valid Cases	127					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 27.87.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.860.

Appendix 7c continued:

PB4 Anxiety * SC Auditory Difficulties

Crosstab

			SC Auditory		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	46	24	70
		Expected Count	44.0	26.0	70.0
	Yes	Count	37	25	62
		Expected Count	39.0	23.0	62.0
Total		Count	83	49	132
		Expected Count	83.0	49.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.513[a]	1	.474	.588	.296	
Continuity Correction[b]	.287	1	.592			
Likelihood Ratio	.513	1	.474	.588	.296	
Fisher's Exact Test				.588	.296	
Linear-by-Linear Association	.509[c]	1	.475	.588	.296	.111
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 23.02.

b. Computed only for a 2x2 table

c. The standardized statistic is .714.

Appendix 7c continued:

PB4 Anxiety * SC Visual Difficulties

Crosstab

			SC Visual		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	58	12	70
		Expected Count	52.0	18.0	70.0
	Yes	Count	40	22	62
		Expected Count	46.0	16.0	62.0
Total		Count	98	34	132
		Expected Count	98.0	34.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.784[a]	1	.016	.018	.014	
Continuity Correction[b]	4.864	1	.027			
Likelihood Ratio	5.825	1	.016	.018	.014	
Fisher's Exact Test				.018	.014	
Linear-by-Linear Association	5.740[c]	1	.017	.018	.014	.009
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.97.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.396.

Appendix 7c continued:

PB4 Anxiety * SC Movement Difficulties

Crosstab

			SC Movement		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	28	42	70
		Expected Count	28.1	41.9	70.0
	Yes	Count	25	37	62
		Expected Count	24.9	37.1	62.0
Total		Count	53	79	132
		Expected Count	53.0	79.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.001[a]	1	.970	1.000	.555	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.001	1	.970	1.000	.555	
Fisher's Exact Test				1.000	.555	
Linear-by-Linear Association	.001[c]	1	.970	1.000	.555	.141
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 24.89.

b. Computed only for a 2x2 table

c. The standardized statistic is -.038.

Appendix 7c continued:

PB4 Anxiety * SC Tactile Difficulties

Crosstab

			SC Tactile		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	36	34	70
		Expected Count	33.4	36.6	70.0
	Yes	Count	27	35	62
		Expected Count	29.6	32.4	62.0
Total		Count	63	69	132
		Expected Count	63.0	69.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.818[a]	1	.366	.388	.233	
Continuity Correction[b]	.533	1	.465			
Likelihood Ratio	.819	1	.365	.388	.233	
Fisher's Exact Test				.388	.233	
Linear-by-Linear Association	.812[c]	1	.367	.388	.233	.093
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.59.

b. Computed only for a 2x2 table

c. The standardized statistic is .901.

Appendix 7c continued:

PB4 Anxiety * SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	33	37	70
		Expected Count	29.7	40.3	70.0
	Yes	Count	23	39	62
		Expected Count	26.3	35.7	62.0
Total		Count	56	76	132
		Expected Count	56.0	76.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.358[a]	1	.244	.291	.161	
Continuity Correction[b]	.978	1	.323			
Likelihood Ratio	1.363	1	.243	.291	.161	
Fisher's Exact Test				.291	.161	
Linear-by-Linear Association	1.348[c]	1	.246	.291	.161	.072
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.30.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.161.

Appendix 7c continued:

PB4 Anxiety * SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Sensory seeking		
			Typical & PD	DD	Total
PB4 Anxiety	no or Not sure	Count	32	38	70
		Expected Count	32.9	37.1	70.0
	Yes	Count	30	32	62
		Expected Count	29.1	32.9	62.0
Total		Count	62	70	132
		Expected Count	62.0	70.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.094[a]	1	.759	.862	.447	
Continuity Correction[b]	.018	1	.895			
Likelihood Ratio	.094	1	.759	.862	.447	
Fisher's Exact Test				.862	.447	
Linear-by-Linear Association	.094[c]	1	.760	.862	.447	.132
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.12.

b. Computed only for a 2x2 table

c. The standardized statistic is -.306.

Appendix 7c continued:

PB4 Anxiety * SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	63	7	70
		Expected Count	58.3	11.7	70.0
	Yes	Count	47	15	62
		Expected Count	51.7	10.3	62.0
Total		Count	110	22	132
		Expected Count	110.0	22.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.769[a]	1	.029	.036	.025	
Continuity Correction[b]	3.802	1	.051			
Likelihood Ratio	4.827	1	.028	.036	.025	
Fisher's Exact Test				.036	.025	
Linear-by-Linear Association	4.733[c]	1	.030	.036	.025	.018
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.33.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.176.

Appendix 7c continued:

PB4 Anxiety * SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	37	33	70
		Expected Count	32.9	37.1	70.0
	Yes	Count	25	37	62
		Expected Count	29.1	32.9	62.0
Total		Count	62	70	132
		Expected Count	62.0	70.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.074[a]	1	.150	.166	.103	
Continuity Correction[b]	1.601	1	.206			
Likelihood Ratio	2.081	1	.149	.166	.103	
Fisher's Exact Test				.166	.103	
Linear-by-Linear Association	2.058[c]	1	.151	.166	.103	.050
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.12.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.435.

Appendix 7c continued:

PB4 Anxiety * SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	52	18	70
		Expected Count	47.7	22.3	70.0
	Yes	Count	38	24	62
		Expected Count	42.3	19.7	62.0
Total		Count	90	42	132
		Expected Count	90.0	42.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.559[a]	1	.110	.135	.079	
Continuity Correction[b]	1.995	1	.158			
Likelihood Ratio	2.562	1	.109	.135	.079	
Fisher's Exact Test				.135	.079	
Linear-by-Linear Association	2.540[c]	1	.111	.135	.079	.042
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.73.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.594.

Appendix 7c continued:

PB4 Anxiety * SC Total Difficulties Score

Crosstab

			SC Total Difficulties		Total
			Typical & PD	DD	
PB4 Anxiety	no or Not sure	Count	43	27	70
		Expected Count	38.2	31.8	70.0
	Yes	Count	29	33	62
		Expected Count	33.8	28.2	62.0
Total		Count	72	60	132
		Expected Count	72.0	60.0	132.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.848[a]	1	.091	.115	.065	
Continuity Correction[b]	2.287	1	.130			
Likelihood Ratio	2.855	1	.091	.115	.065	
Fisher's Exact Test				.115	.065	
Linear-by-Linear Association	2.826[c]	1	.093	.115	.065	.034
N of Valid Cases	132					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 28.18.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.681.

Appendix 7d

Frequency Tables for Associations between Parental Background Factor 5 (Assessed by an Occupational Therapist) and SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC	Sensory Profile School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

PB5 Assessed by an Occupational Therapist * SSP Tactile Difficulties

Crosstab

			SSP Tactile		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	70	26	96
		Expected Count	69.0	27.0	96.0
	Yes	Count	22	10	32
		Expected Count	23.0	9.0	32.0
Total		Count	92	36	128
		Expected Count	92.0	36.0	128.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.206[a]	1	.650	.821	.404	
Continuity Correction[b]	.052	1	.820			
Likelihood Ratio	.203	1	.652	.821	.404	
Fisher's Exact Test				.655	.404	
Linear-by-Linear Association	.205[c]	1	.651	.821	.404	.159
N of Valid Cases	128					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.00.

b. Computed only for a 2x2 table

c. The standardized statistic is .452.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SSP Taste Difficulties

Crosstab

			SSP Taste		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	67	29	96
		Expected Count	67.5	28.5	96.0
	Yes	Count	23	9	32
		Expected Count	22.5	9.5	32.0
Total		Count	90	38	128
		Expected Count	90.0	38.0	128.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.050[a]	1	.823	1.000	.506	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.050	1	.823	.830	.506	
Fisher's Exact Test				1.000	.506	
Linear-by-Linear Association	.050[c]	1	.824	1.000	.506	.174
N of Valid Cases	128					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.50.

b. Computed only for a 2x2 table

c. The standardized statistic is -.223.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SSP Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	78	18	96
		Expected Count	73.7	22.3	96.0
	Yes	Count	21	12	33
		Expected Count	25.3	7.7	33.0
Total		Count	99	30	129
		Expected Count	99.0	30.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.269[a]	1	.039	.055	.037	
Continuity Correction[b]	3.339	1	.068			
Likelihood Ratio	4.009	1	.045	.055	.037	
Fisher's Exact Test				.055	.037	
Linear-by-Linear Association	4.236[c]	1	.040	.055	.037	.024
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.67.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.058.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks		
			Typical & PD	DD	Total
PB5 OT Assess	no or Not sure	Count	29	68	97
		Expected Count	29.3	67.7	97.0
	Yes	Count	10	22	32
		Expected Count	9.7	22.3	32.0
Total		Count	39	90	129
		Expected Count	39.0	90.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.021[a]	1	.885	1.000	.525	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.021	1	.885	1.000	.525	
Fisher's Exact Test				1.000	.525	
Linear-by-Linear Association	.021[c]	1	.886	1.000	.525	.172
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.67.

b. Computed only for a 2x2 table

c. The standardized statistic is -.144.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	33	62	95
		Expected Count	29.9	65.1	95.0
	Yes	Count	7	25	32
		Expected Count	10.1	21.9	32.0
Total		Count	40	87	127
		Expected Count	40.0	87.0	127.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.835[a]	1	.176	.195	.127	
Continuity Correction[b]	1.288	1	.256			
Likelihood Ratio	1.922	1	.166	.195	.127	
Fisher's Exact Test				.195	.127	
Linear-by-Linear Association	1.821[c]	1	.177	.195	.127	.073
N of Valid Cases	127					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.08.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.349.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SSP Low Energy

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	74	22	96
		Expected Count	68.0	28.0	96.0
	Yes	Count	16	15	31
		Expected Count	22.0	9.0	31.0
Total		Count	90	37	127
		Expected Count	90.0	37.0	127.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.363[a]	1	.007	.011	.008	
Continuity Correction[b]	6.181	1	.013			
Likelihood Ratio	6.960	1	.008	.011	.008	
Fisher's Exact Test				.011	.008	
Linear-by-Linear Association	7.305[c]	1	.007	.011	.008	.005
N of Valid Cases	127					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.03.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.703.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	80	15	95
		Expected Count	74.8	20.2	95.0
	Yes	Count	20	12	32
		Expected Count	25.2	6.8	32.0
Total		Count	100	27	127
		Expected Count	100.0	27.0	127.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.740[a]	1	.009	.013	.011	
Continuity Correction[b]	5.505	1	.019			
Likelihood Ratio	6.203	1	.013	.023	.011	
Fisher's Exact Test				.013	.011	
Linear-by-Linear Association	6.687[c]	1	.010	.013	.011	.008
N of Valid Cases	127					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.80.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.586.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SSP Total Difficulties Score

Crosstab

			SSP Total Diffs		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	50	44	94
		Expected Count	43.6	50.4	94.0
	Yes	Count	8	23	31
		Expected Count	14.4	16.6	31.0
Total		Count	58	67	125
		Expected Count	58.0	67.0	125.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.029[a]	1	.008	.012	.007	
Continuity Correction[b]	5.971	1	.015			
Likelihood Ratio	7.306	1	.007	.012	.007	
Fisher's Exact Test				.012	.007	
Linear-by-Linear Association	6.973[c]	1	.008	.012	.007	.005
N of Valid Cases	125					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.38.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.641.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC Auditory Difficulties

Crosstab

			SC Auditory		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	62	35	97
		Expected Count	60.4	36.6	97.0
	Yes	Count	19	14	33
		Expected Count	20.6	12.4	33.0
Total		Count	81	49	130
		Expected Count	81.0	49.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.422[a]	1	.516	.538	.327	
Continuity Correction[b]	.195	1	.659			
Likelihood Ratio	.418	1	.518	.538	.327	
Fisher's Exact Test				.538	.327	
Linear-by-Linear Association	.418[c]	1	.518	.538	.327	.132
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.44.

b. Computed only for a 2x2 table

c. The standardized statistic is .647.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC Visual Difficulties

Crosstab

			SC Visual		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	77	20	97
		Expected Count	71.6	25.4	97.0
	Yes	Count	19	14	33
		Expected Count	24.4	8.6	33.0
Total		Count	96	34	130
		Expected Count	96.0	34.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.062[a]	1	.014	.021	.015	
Continuity Correction[b]	4.986	1	.026			
Likelihood Ratio	5.706	1	.017	.021	.015	
Fisher's Exact Test				.021	.015	
Linear-by-Linear Association	6.015[c]	1	.014	.021	.015	.010
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.63.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.453.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC Movement Difficulties

Crosstab

			SC Movement		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	41	56	97
		Expected Count	39.5	57.5	97.0
	Yes	Count	12	21	33
		Expected Count	13.5	19.5	33.0
Total		Count	53	77	130
		Expected Count	53.0	77.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.355[a]	1	.551	.682	.350	
Continuity Correction[b]	.153	1	.696			
Likelihood Ratio	.359	1	.549	.682	.350	
Fisher's Exact Test				.682	.350	
Linear-by-Linear Association	.353[c]	1	.553	.682	.350	.138
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.45.

b. Computed only for a 2x2 table

c. The standardized statistic is .594.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC Tactile Difficulties

Crosstab

			SC Tactile		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	49	48	97
		Expected Count	47.0	50.0	97.0
	Yes	Count	14	19	33
		Expected Count	16.0	17.0	33.0
Total		Count	63	67	130
		Expected Count	63.0	67.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.645[a]	1	.422	.546	.274	
Continuity Correction[b]	.362	1	.547			
Likelihood Ratio	.648	1	.421	.546	.274	
Fisher's Exact Test				.546	.274	
Linear-by-Linear Association	.640[c]	1	.424	.546	.274	.117
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.99.

b. Computed only for a 2x2 table

c. The standardized statistic is .800.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		
			Typical & PD	DD	Total
PB5 OT Assess	no or Not sure	Count	42	55	97
		Expected Count	41.0	56.0	97.0
	Yes	Count	13	20	33
		Expected Count	14.0	19.0	33.0
Total		Count	55	75	130
		Expected Count	55.0	75.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.154[a]	1	.695	.839	.427	
Continuity Correction[b]	.035	1	.851			
Likelihood Ratio	.155	1	.694	.839	.427	
Fisher's Exact Test				.839	.427	
Linear-by-Linear Association	.153[c]	1	.696	.839	.427	.151
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.96.

b. Computed only for a 2x2 table

c. The standardized statistic is .391.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Seek/Registration		
			Typical & PD	DD	Total
PB5 OT Assess	no or Not sure	Count	48	49	97
		Expected Count	46.3	50.7	97.0
	Yes	Count	14	19	33
		Expected Count	15.7	17.3	33.0
Total		Count	62	68	130
		Expected Count	62.0	68.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.492[a]	1	.483	.548	.309	
Continuity Correction[b]	.250	1	.617			
Likelihood Ratio	.494	1	.482	.548	.309	
Fisher's Exact Test				.548	.309	
Linear-by-Linear Association	.488[c]	1	.485	.548	.309	.126
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.74.

b. Computed only for a 2x2 table

c. The standardized statistic is .699.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	80	17	97
		Expected Count	80.6	16.4	97.0
	Yes	Count	28	5	33
		Expected Count	27.4	5.6	33.0
Total		Count	108	22	130
		Expected Count	108.0	22.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.099[a]	1	.753	.798	.494	
Continuity Correction[b]	.002	1	.964			
Likelihood Ratio	.101	1	.751	.798	.494	
Fisher's Exact Test				1.000	.494	
Linear-by-Linear Association	.098[c]	1	.754	.798	.494	.206
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.58.

b. Computed only for a 2x2 table

c. The standardized statistic is -.313.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	48	49	97
		Expected Count	44.8	52.2	97.0
	Yes	Count	12	21	33
		Expected Count	15.2	17.8	33.0
Total		Count	60	70	130
		Expected Count	60.0	70.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.706[a]	1	.192	.228	.135	
Continuity Correction[b]	1.219	1	.270			
Likelihood Ratio	1.726	1	.189	.228	.135	
Fisher's Exact Test				.228	.135	
Linear-by-Linear Association	1.693[c]	1	.193	.228	.135	.070
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.23.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.301.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		
			Typical & PD	DD	Total
PB5 OT Assess	no or Not sure	Count	66	31	97
		Expected Count	65.7	31.3	97.0
	Yes	Count	22	11	33
		Expected Count	22.3	10.7	33.0
Total		Count	88	42	130
		Expected Count	88.0	42.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.021[a]	1	.884	1.000	.523	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.021	1	.884	1.000	.523	
Fisher's Exact Test				1.000	.523	
Linear-by-Linear Association	.021[c]	1	.884	1.000	.523	.168
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.66.

b. Computed only for a 2x2 table

c. The standardized statistic is .145.

Appendix 7d continued:

PB5 Assessed by an Occupational Therapist * SC Total Difficulties Score

Crosstab

			SC Total Diffs		Total
			Typical & PD	DD	
PB5 OT Assess	no or Not sure	Count	56	41	97
		Expected Count	53.0	44.0	97.0
	Yes	Count	15	18	33
		Expected Count	18.0	15.0	33.0
Total		Count	71	59	130
		Expected Count	71.0	59.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.497[a]	1	.221	.232	.154	
Continuity Correction[b]	1.043	1	.307			
Likelihood Ratio	1.493	1	.222	.232	.154	
Fisher's Exact Test				.232	.154	
Linear-by-Linear Association	1.486[c]	1	.223	.232	.154	.077
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.98.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.219.

Appendix 7e

Frequency Tables for Associations between Teacher Background Factor 1 (Behaviour Difficulties) and SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC	Sensory Profile School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

TB1 Behaviour Difficulties * SSP Tactile Difficulties

Crosstab

			SSP Tactile		
			Typical & PD	DD	Total
TB1 Behaviour Difficulties	no or Not sure	Count	20	5	25
		Expected Count	17.9	7.1	25.0
	Yes	Count	73	32	105
		Expected Count	75.1	29.9	105.0
Total		Count	93	37	130
		Expected Count	93.0	37.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.088[a]	1	.297	.337	.216	
Continuity Correction[b]	.635	1	.426			
Likelihood Ratio	1.150	1	.284	.337	.216	
Fisher's Exact Test				.337	.216	
Linear-by-Linear Association	1.080[c]	1	.299	.337	.216	.120
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.12.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.039.

Appendix 7e continued:

TB1 Behaviour Difficulties * SSP Taste Difficulties

Crosstab

			SSP Taste		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	21	4	25
		Expected Count	17.5	7.5	25.0
	Yes	Count	70	35	105
		Expected Count	73.5	31.5	105.0
Total		Count	91	39	130
		Expected Count	91.0	39.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.889[a]	1	.089	.143	.068	
Continuity Correction[b]	2.122	1	.145			
Likelihood Ratio	3.173	1	.075	.097	.068	
Fisher's Exact Test				.143	.068	
Linear-by-Linear Association	2.867[c]	1	.090	.143	.068	.047
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.50.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.693.

Appendix 7e continued:

TB1 Behaviour Difficulties * SSP Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	21	4	25
		Expected Count	18.9	6.1	25.0
	Yes	Count	78	28	106
		Expected Count	80.1	25.9	106.0
Total		Count	99	32	131
		Expected Count	99.0	32.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.189[a]	1	.276	.315	.206	
Continuity Correction[b]	.691	1	.406			
Likelihood Ratio	1.278	1	.258	.315	.206	
Fisher's Exact Test				.315	.206	
Linear-by-Linear Association	1.180[c]	1	.277	.315	.206	.122
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.11.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.086.

Appendix 7e continued:

TB1 Behaviour Difficulties * SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks Sensation		
			Typical & PD	DD	Total
TB1 Behaviour Difficulties	no or Not sure	Count	4	21	25
		Expected Count	7.6	17.4	25.0
	Yes	Count	36	70	106
		Expected Count	32.4	73.6	106.0
Total		Count	40	91	131
		Expected Count	40.0	91.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.077[a]	1	.079	.094	.061	
Continuity Correction[b]	2.288	1	.130			
Likelihood Ratio	3.385	1	.066	.094	.061	
Fisher's Exact Test				.094	.061	
Linear-by-Linear Association	3.054[c]	1	.081	.094	.061	.042
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.63.

b. Computed only for a 2x2 table

c. The standardized statistic is -1.747.

Appendix 7e continued:

TB1 Behaviour Difficulties * SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	4	21	25
		Expected Count	7.8	17.2	25.0
	Yes	Count	36	68	104
		Expected Count	32.2	71.8	104.0
Total		Count	40	89	129
		Expected Count	40.0	89.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.265[a]	1	.071	.092	.054	
Continuity Correction[b]	2.453	1	.117			
Likelihood Ratio	3.594	1	.058	.092	.054	
Fisher's Exact Test				.092	.054	
Linear-by-Linear Association	3.239[c]	1	.072	.092	.054	.038
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.75.

b. Computed only for a 2x2 table

c. The standardized statistic is -1.800.

Appendix 7e continued:

TB1 Behaviour Difficulties * SSP Low Energy

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	20	4	24
		Expected Count	16.9	7.1	24.0
	Yes	Count	71	34	105
		Expected Count	74.1	30.9	105.0
Total		Count	91	38	129
		Expected Count	91.0	38.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.321[a]	1	.128	.145	.098	
Continuity Correction[b]	1.627	1	.202			
Likelihood Ratio	2.533	1	.111	.145	.098	
Fisher's Exact Test				.145	.098	
Linear-by-Linear Association	2.303[c]	1	.129	.145	.098	.065
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.07.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.518.

Appendix 7e continued:

TB1 Behaviour Difficulties * SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	21	4	25
		Expected Count	19.6	5.4	25.0
	Yes	Count	80	24	104
		Expected Count	81.4	22.6	104.0
Total		Count	101	28	129
		Expected Count	101.0	28.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.594[a]	1	.441	.592	.318	
Continuity Correction[b]	.251	1	.617			
Likelihood Ratio	.628	1	.428	.592	.318	
Fisher's Exact Test				.592	.318	
Linear-by-Linear Association	.589[c]	1	.443	.592	.318	.169
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.43.

b. Computed only for a 2x2 table

c. The standardized statistic is .768.

Appendix 7e continued:

TB1 Behaviour Difficulties * SSP Total Difficulties Score

Crosstab

			SS Total Difficulties		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	9	15	24
		Expected Count	10.8	13.2	24.0
	Yes	Count	48	55	103
		Expected Count	46.2	56.8	103.0
Total		Count	57	70	127
		Expected Count	57.0	70.0	127.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.652[a]	1	.419	.498	.283	
Continuity Correction[b]	.336	1	.562			
Likelihood Ratio	.659	1	.417	.498	.283	
Fisher's Exact Test				.498	.283	
Linear-by-Linear Association	.647[c]	1	.421	.498	.283	.132
N of Valid Cases	127					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.77.

b. Computed only for a 2x2 table

c. The standardized statistic is -.804.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC Auditory Difficulties

Crosstab

			SC Auditory		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	19	8	27
		Expected Count	17.2	9.8	27.0
	Yes	Count	70	43	113
		Expected Count	71.8	41.2	113.0
Total		Count	89	51	140
		Expected Count	89.0	51.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.668[a]	1	.414	.507	.279	
Continuity Correction[b]	.354	1	.552			
Likelihood Ratio	.684	1	.408	.507	.279	
Fisher's Exact Test				.507	.279	
Linear-by-Linear Association	.663[c]	1	.416	.507	.279	.130
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.84.

b. Computed only for a 2x2 table

c. The standardized statistic is .814.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC Visual Difficulties

Crosstab

			SC Visual		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	22	5	27
		Expected Count	20.3	6.8	27.0
	Yes	Count	83	30	113
		Expected Count	84.8	28.3	113.0
Total		Count	105	35	140
		Expected Count	105.0	35.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.749[a]	1	.387	.466	.274	
Continuity Correction[b]	.382	1	.536			
Likelihood Ratio	.789	1	.375	.466	.274	
Fisher's Exact Test				.466	.274	
Linear-by-Linear Association	.744[c]	1	.388	.466	.274	.143
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.75.

b. Computed only for a 2x2 table

c. The standardized statistic is .863.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC Movement Difficulties

Crosstab

			SC Movement		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	13	14	27
		Expected Count	10.8	16.2	27.0
	Yes	Count	43	70	113
		Expected Count	45.2	67.8	113.0
Total		Count	56	84	140
		Expected Count	56.0	84.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.925[a]	1	.336	.385	.228	
Continuity Correction[b]	.553	1	.457			
Likelihood Ratio	.913	1	.339	.385	.228	
Fisher's Exact Test				.385	.228	
Linear-by-Linear Association	.919[c]	1	.338	.385	.228	.108
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.80.

b. Computed only for a 2x2 table

c. The standardized statistic is .959.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC Tactile Difficulties

Crosstab

			SC Tactile		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	14	13	27
		Expected Count	12.9	14.1	27.0
	Yes	Count	53	60	113
		Expected Count	54.1	58.9	113.0
Total		Count	67	73	140
		Expected Count	67.0	73.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.214[a]	1	.644	.673	.402	
Continuity Correction[b]	.062	1	.804			
Likelihood Ratio	.214	1	.644	.673	.402	
Fisher's Exact Test				.673	.402	
Linear-by-Linear Association	.212[c]	1	.645	.673	.402	.152
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.92.

b. Computed only for a 2x2 table

c. The standardized statistic is .461.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	15	12	27
		Expected Count	11.6	15.4	27.0
	Yes	Count	45	68	113
		Expected Count	48.4	64.6	113.0
Total		Count	60	80	140
		Expected Count	60.0	80.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.203[a]	1	.138	.194	.103	
Continuity Correction[b]	1.607	1	.205			
Likelihood Ratio	2.181	1	.140	.194	.103	
Fisher's Exact Test				.194	.103	
Linear-by-Linear Association	2.187[c]	1	.139	.194	.103	.058
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.57.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.479.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Seeking/Registration		
			Typical & PD	DD	Total
TB1 Behaviour Difficulties	no or Not sure	Count	18	9	27
		Expected Count	12.7	14.3	27.0
	Yes	Count	48	65	113
		Expected Count	53.3	59.7	113.0
Total		Count	66	74	140
		Expected Count	66.0	74.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.117[a]	1	.024	.032	.020	
Continuity Correction[b]	4.192	1	.041			
Likelihood Ratio	5.168	1	.023	.032	.020	
Fisher's Exact Test				.032	.020	
Linear-by-Linear Association	5.081[c]	1	.024	.032	.020	.014
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.73.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.254.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	23	4	27
		Expected Count	22.6	4.4	27.0
	Yes	Count	94	19	113
		Expected Count	94.4	18.6	113.0
Total		Count	117	23	140
		Expected Count	117.0	23.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.063[a]	1	.801	1.000	.531	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.065	1	.799	1.000	.531	
Fisher's Exact Test				1.000	.531	
Linear-by-Linear Association	.063[c]	1	.802	1.000	.531	.226
N of Valid Cases	140					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.44.

b. Computed only for a 2x2 table

c. The standardized statistic is .251.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		
			Typical & PD	DD	Total
TB1 Behaviour Difficulties	no or Not sure	Count	16	11	27
		Expected Count	12.7	14.3	27.0
	Yes	Count	50	63	113
		Expected Count	53.3	59.7	113.0
Total		Count	66	74	140
		Expected Count	66.0	74.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.971[a]	1	.160	.199	.117	
Continuity Correction[b]	1.414	1	.234			
Likelihood Ratio	1.973	1	.160	.199	.117	
Fisher's Exact Test				.199	.117	
Linear-by-Linear Association	1.957[c]	1	.162	.199	.117	.065
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.73.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.399.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		
			Typical & PD	DD	Total
TB1 Behaviour Difficulties	no or Not sure	Count	16	11	27
		Expected Count	18.5	8.5	27.0
	Yes	Count	80	33	113
		Expected Count	77.5	35.5	113.0
Total		Count	96	44	140
		Expected Count	96.0	44.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.346[a]	1	.246	.257	.176	
Continuity Correction[b]	.864	1	.353			
Likelihood Ratio	1.302	1	.254	.356	.176	
Fisher's Exact Test				.257	.176	
Linear-by-Linear Association	1.336[c]	1	.248	.257	.176	.092
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.49.

b. Computed only for a 2x2 table

c. The standardized statistic is -1.156.

Appendix 7e continued:

TB1 Behaviour Difficulties * SC Total Difficulties Score

Crosstab

			SC Total Diffs		Total
			Typical & PD	DD	
TB1 Behaviour Difficulties	no or Not sure	Count	16	11	27
		Expected Count	14.9	12.2	27.0
	Yes	Count	61	52	113
		Expected Count	62.2	50.9	113.0
Total		Count	77	63	140
		Expected Count	77.0	63.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.245[a]	1	.620	.671	.392	
Continuity Correction[b]	.078	1	.780			
Likelihood Ratio	.247	1	.620	.671	.392	
Fisher's Exact Test				.671	.392	
Linear-by-Linear Association	.243[c]	1	.622	.671	.392	.152
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.15.

b. Computed only for a 2x2 table

c. The standardized statistic is .493.

Appendix 7f

Frequency Tables for Associations between Teacher Background Factor 3 (Assessed by an Occupational Therapist) and SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC	Sensory Profile School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

TB3 Assessed by an Occupational Therapist* SSP Tactile Difficulties

Crosstab

			SSP Tactile		
			Typical & PD	DD	Total
TB3 OT Assess	no or Not sure	Count	79	33	112
		Expected Count	80.3	31.7	112.0
	Yes	Count	12	3	15
		Expected Count	10.7	4.3	15.0
Total		Count	91	36	127
		Expected Count	91.0	36.0	127.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.583[a]	1	.445	.553	.334	
Continuity Correction[b]	.210	1	.646			
Likelihood Ratio	.620	1	.431	.553	.334	
Fisher's Exact Test				.553	.334	
Linear-by-Linear Association	.579[c]	1	.447	.553	.334	.193
N of Valid Cases	127					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.25.

b. Computed only for a 2x2 table

c. The standardized statistic is -.761.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SSP Taste Difficulties

Crosstab

			SSP Taste		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	75	37	112
		Expected Count	78.5	33.5	112.0
	Yes	Count	14	1	15
		Expected Count	10.5	4.5	15.0
Total		Count	89	38	127
		Expected Count	89.0	38.0	127.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.387[a]	1	.036	.067	.028	
Continuity Correction[b]	3.219	1	.073			
Likelihood Ratio	5.529	1	.019	.038	.028	
Fisher's Exact Test				.038	.028	
Linear-by-Linear Association	4.352[c]	1	.037	.067	.028	.025
N of Valid Cases	127					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.49.

b. Computed only for a 2x2 table

c. The standardized statistic is -2.086.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SSP Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	84	28	112
		Expected Count	84.0	28.0	112.0
	Yes	Count	12	4	16
		Expected Count	12.0	4.0	16.0
Total		Count	96	32	128
		Expected Count	96.0	32.0	128.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.000[a]	1	1.000	1.000	.634	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.000	1	1.000	1.000	.634	
Fisher's Exact Test				1.000	.634	
Linear-by-Linear Association	.000[c]	1	1.000	1.000	.634	.241
N of Valid Cases	128					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.00.

b. Computed only for a 2x2 table

c. The standardized statistic is .000.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	36	77	113
		Expected Count	33.5	79.5	113.0
	Yes	Count	2	13	15
		Expected Count	4.5	10.5	15.0
Total		Count	38	90	128
		Expected Count	38.0	90.0	128.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.177[a]	1	.140	.228	.117	
Continuity Correction[b]	1.380	1	.240			
Likelihood Ratio	2.487	1	.115	.154	.117	
Fisher's Exact Test				.228	.117	
Linear-by-Linear Association	2.160[c]	1	.142	.228	.117	.087
N of Valid Cases	128					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.45.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.470.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	36	75	111
		Expected Count	34.4	76.6	111.0
	Yes	Count	3	12	15
		Expected Count	4.6	10.4	15.0
Total		Count	39	87	126
		Expected Count	39.0	87.0	126.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.956[a]	1	.328	.390	.254	
Continuity Correction[b]	.462	1	.496			
Likelihood Ratio	1.026	1	.311	.390	.254	
Fisher's Exact Test				.390	.254	
Linear-by-Linear Association	.948[c]	1	.330	.390	.254	.158
N of Valid Cases	126					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.64.

b. Computed only for a 2x2 table

c. The standardized statistic is .974.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SSP Low Energy

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	80	32	112
		Expected Count	78.2	33.8	112.0
	Yes	Count	8	6	14
		Expected Count	9.8	4.2	14.0
Total		Count	88	38	126
		Expected Count	88.0	38.0	126.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.206[a]	1	.272	.354	.212	
Continuity Correction[b]	.623	1	.430			
Likelihood Ratio	1.141	1	.285	.354	.212	
Fisher's Exact Test				.354	.212	
Linear-by-Linear Association	1.196[c]	1	.274	.354	.212	.129
N of Valid Cases	126					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.22.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.094.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	87	24	111
		Expected Count	86.3	24.7	111.0
	Yes	Count	11	4	15
		Expected Count	11.7	3.3	15.0
Total		Count	98	28	126
		Expected Count	98.0	28.0	126.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.195[a]	1	.659	.741	.437	
Continuity Correction[b]	.012	1	.912			
Likelihood Ratio	.187	1	.665	.741	.437	
Fisher's Exact Test				.741	.437	
Linear-by-Linear Association	.193[c]	1	.660	.741	.437	.223
N of Valid Cases	126					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.33.

b. Computed only for a 2x2 table

c. The standardized statistic is .439.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SSP Total Difficulties Score

Crosstab

			SSP Total Diffs		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	53	57	110
		Expected Count	48.8	61.2	110.0
	Yes	Count	2	12	14
		Expected Count	6.2	7.8	14.0
Total		Count	55	69	124
		Expected Count	55.0	69.0	124.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.781[a]	1	.016	.021	.014	
Continuity Correction[b]	4.490	1	.034			
Likelihood Ratio	6.486	1	.011	.021	.014	
Fisher's Exact Test				.021	.014	
Linear-by-Linear Association	5.735[c]	1	.017	.021	.014	.012
N of Valid Cases	124					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.21.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.395.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC Auditory Difficulties

Crosstab

			SC Auditory		
			Typical & PD	DD	Total
TB3 OT Assess	no or Not sure	Count	74	43	117
		Expected Count	74.3	42.7	117.0
	Yes	Count	13	7	20
		Expected Count	12.7	7.3	20.0
Total		Count	87	50	137
		Expected Count	87.0	50.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.023[a]	1	.880	1.000	.546	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.023	1	.880	1.000	.546	
Fisher's Exact Test				1.000	.546	
Linear-by-Linear Association	.022[c]	1	.881	1.000	.546	.197
N of Valid Cases	137					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.30.

b. Computed only for a 2x2 table

c. The standardized statistic is -.150.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC Visual Difficulties

Crosstab

			SC Visual		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	91	26	117
		Expected Count	88.0	29.0	117.0
	Yes	Count	12	8	20
		Expected Count	15.0	5.0	20.0
Total		Count	103	34	137
		Expected Count	103.0	34.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.893[a]	1	.089	.099	.081	
Continuity Correction[b]	2.019	1	.155			
Likelihood Ratio	2.656	1	.103	.159	.081	
Fisher's Exact Test				.099	.081	
Linear-by-Linear Association	2.872[c]	1	.090	.099	.081	.053
N of Valid Cases	137					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.96.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.695.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC Movement Difficulties

Crosstab

			SC Movement		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	49	68	117
		Expected Count	47.0	70.0	117.0
	Yes	Count	6	14	20
		Expected Count	8.0	12.0	20.0
Total		Count	55	82	137
		Expected Count	55.0	82.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.003[a]	1	.317	.339	.227	
Continuity Correction[b]	.570	1	.450			
Likelihood Ratio	1.034	1	.309	.339	.227	
Fisher's Exact Test				.460	.227	
Linear-by-Linear Association	.996[c]	1	.318	.339	.227	.123
N of Valid Cases	137					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.03.

b. Computed only for a 2x2 table

c. The standardized statistic is .998.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC Tactile Difficulties

Crosstab

			SC Tactile		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	61	56	117
		Expected Count	56.4	60.6	117.0
	Yes	Count	5	15	20
		Expected Count	9.6	10.4	20.0
Total		Count	66	71	137
		Expected Count	66.0	71.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.038[a]	1	.025	.030	.021	
Continuity Correction[b]	4.010	1	.045			
Likelihood Ratio	5.264	1	.022	.030	.021	
Fisher's Exact Test				.030	.021	
Linear-by-Linear Association	5.001[c]	1	.025	.030	.021	.016
N of Valid Cases	137					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.64.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.236.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	49	68	117
		Expected Count	50.4	66.6	117.0
	Yes	Count	10	10	20
		Expected Count	8.6	11.4	20.0
Total		Count	59	78	137
		Expected Count	59.0	78.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.459[a]	1	.498	.626	.330	
Continuity Correction[b]	.188	1	.665			
Likelihood Ratio	.456	1	.500	.626	.330	
Fisher's Exact Test				.626	.330	
Linear-by-Linear Association	.456[c]	1	.500	.626	.330	.152
N of Valid Cases	137					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.61.

b. Computed only for a 2x2 table

c. The standardized statistic is -.675.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Seeking/Registration		
			Typical & PD	DD	Total
TB3 OT Assess	no or Not sure	Count	59	58	117
		Expected Count	54.7	62.3	117.0
	Yes	Count	5	15	20
		Expected Count	9.3	10.7	20.0
Total		Count	64	73	137
		Expected Count	64.0	73.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.436[a]	1	.035	.051	.029	
Continuity Correction[b]	3.474	1	.062			
Likelihood Ratio	4.649	1	.031	.051	.029	
Fisher's Exact Test				.051	.029	
Linear-by-Linear Association	4.404[c]	1	.036	.051	.029	.021
N of Valid Cases	137					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.34.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.099.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	99	18	117
		Expected Count	98.2	18.8	117.0
	Yes	Count	16	4	20
		Expected Count	16.8	3.2	20.0
Total		Count	115	22	137
		Expected Count	115.0	22.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.270[a]	1	.603	.741	.405	
Continuity Correction[b]	.036	1	.849			
Likelihood Ratio	.257	1	.612	.741	.405	
Fisher's Exact Test				.530	.405	
Linear-by-Linear Association	.268[c]	1	.605	.741	.405	.211
N of Valid Cases	137					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.21.

b. Computed only for a 2x2 table

c. The standardized statistic is .518.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	55	62	117
		Expected Count	54.7	62.3	117.0
	Yes	Count	9	11	20
		Expected Count	9.3	10.7	20.0
Total		Count	64	73	137
		Expected Count	64.0	73.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.028[a]	1	.868	1.000	.532	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.028	1	.868	1.000	.532	
Fisher's Exact Test				1.000	.532	
Linear-by-Linear Association	.027[c]	1	.868	1.000	.532	.189
N of Valid Cases	137					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.34.

b. Computed only for a 2x2 table

c. The standardized statistic is .166.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		
			Typical & PD	DD	Total
TB3 OT Assess	no or Not sure	Count	79	38	117
		Expected Count	79.4	37.6	117.0
	Yes	Count	14	6	20
		Expected Count	13.6	6.4	20.0
Total		Count	93	44	137
		Expected Count	93.0	44.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.048[a]	1	.826	1.000	.525	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.049	1	.825	1.000	.525	
Fisher's Exact Test				1.000	.525	
Linear-by-Linear Association	.048[c]	1	.827	1.000	.525	.202
N of Valid Cases	137					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.42.

b. Computed only for a 2x2 table

c. The standardized statistic is -.219.

Appendix 7f continued:

TB3 Assessed by an Occupational Therapist* SC Total Difficulties Score

Crosstab

			SC Total Difficulties		Total
			Typical & PD	DD	
TB3 OT Assess	no or Not sure	Count	69	48	117
		Expected Count	64.9	52.1	117.0
	Yes	Count	7	13	20
		Expected Count	11.1	8.9	20.0
Total		Count	76	61	137
		Expected Count	76.0	61.0	137.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.975[a]	1	.046	.054	.040	
Continuity Correction[b]	3.063	1	.080			
Likelihood Ratio	3.972	1	.046	.054	.040	
Fisher's Exact Test				.054	.040	
Linear-by-Linear Association	3.946[c]	1	.047	.054	.040	.028
N of Valid Cases	137					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.91.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.986.

Appendix 7g:

Frequency Tables for Associations between Teacher Background Factor 4 (Teacher Rating of the Child's Anxiety) and SSP and SC Subscales.

Key:

P=	Parental	T=	Teacher
SSP=	Short Sensory Profile		
SC	Sensory Profile School Companion		
PD=	Probable Difference (i.e. Probable difficulties)		
DD=	Definite Difference (i.e. Difficulties)		

TB4 Anxiety* SSP Tactile Difficulties

Crosstab

			SSP Tactile		
			Typical & PD	DD	Total
TB4 Anxiety	no or Not sure	Count	53	19	72
		Expected Count	51.5	20.5	72.0
	Yes	Count	40	18	58
		Expected Count	41.5	16.5	58.0
Total		Count	93	37	130
		Expected Count	93.0	37.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.340[a]	1	.560	.696	.348	
Continuity Correction[b]	.151	1	.698			
Likelihood Ratio	.340	1	.560	.696	.348	
Fisher's Exact Test				.565	.348	
Linear-by-Linear Association	.338[c]	1	.561	.696	.348	.130
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.51.

b. Computed only for a 2x2 table

c. The standardized statistic is .581.

Appendix 7g continued:

TB4 Anxiety* SSP Taste Difficulties

Crosstab

			SSP Taste		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	52	20	72
		Expected Count	50.4	21.6	72.0
	Yes	Count	39	19	58
		Expected Count	40.6	17.4	58.0
Total		Count	91	39	130
		Expected Count	91.0	39.0	130.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.379[a]	1	.538	.568	.335	
Continuity Correction[b]	.179	1	.672			
Likelihood Ratio	.379	1	.538	.568	.335	
Fisher's Exact Test				.568	.335	
Linear-by-Linear Association	.377[c]	1	.539	.568	.335	.126
N of Valid Cases	130					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.40.

b. Computed only for a 2x2 table

c. The standardized statistic is .614.

Appendix 7g continued:

TB4 Anxiety* P Movement Difficulties

Crosstab

			SSP Movement		
			Typical & PD	DD	Total
TB4 Anxiety	no or Not sure	Count	58	14	72
		Expected Count	54.4	17.6	72.0
	Yes	Count	41	18	59
		Expected Count	44.6	14.4	59.0
Total		Count	99	32	131
		Expected Count	99.0	32.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.150[a]	1	.143	.158	.104	
Continuity Correction[b]	1.593	1	.207			
Likelihood Ratio	2.143	1	.143	.158	.104	
Fisher's Exact Test				.158	.104	
Linear-by-Linear Association	2.134[c]	1	.144	.158	.104	.056
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.41.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.461.

Appendix 7g continued:

TB4 Anxiety* SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks Sensation		
			Typical & PD	DD	Total
TB4 Anxiety	no or Not sure	Count	20	53	73
		Expected Count	22.3	50.7	73.0
	Yes	Count	20	38	58
		Expected Count	17.7	40.3	58.0
Total		Count	40	91	131
		Expected Count	40.0	91.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.765[a]	1	.382	.446	.247	
Continuity Correction[b]	.467	1	.494			
Likelihood Ratio	.763	1	.383	.446	.247	
Fisher's Exact Test				.446	.247	
Linear-by-Linear Association	.759[c]	1	.384	.446	.247	.103
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.71.

b. Computed only for a 2x2 table

c. The standardized statistic is -.871.

Appendix 7g continued:

Anxiety* SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	21	51	72
		Expected Count	22.3	49.7	72.0
	Yes	Count	19	38	57
		Expected Count	17.7	39.3	57.0
Total		Count	40	89	129
		Expected Count	40.0	89.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.258[a]	1	.611	.702	.375	
Continuity Correction[b]	.100	1	.752			
Likelihood Ratio	.258	1	.612	.702	.375	
Fisher's Exact Test				.702	.375	
Linear-by-Linear Association	.256[c]	1	.613	.702	.375	.133
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.67.

b. Computed only for a 2x2 table

c. The standardized statistic is -.506.

Appendix 7g continued:

TB4 Anxiety* SSP Low Energy

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	55	17	72
		Expected Count	50.8	21.2	72.0
	Yes	Count	36	21	57
		Expected Count	40.2	16.8	57.0
Total		Count	91	38	129
		Expected Count	91.0	38.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.680[a]	1	.102	.121	.075	
Continuity Correction[b]	2.081	1	.149			
Likelihood Ratio	2.670	1	.102	.121	.075	
Fisher's Exact Test				.121	.075	
Linear-by-Linear Association	2.659[c]	1	.103	.121	.075	.041
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.79.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.631.

Appendix 7g continued:

TB4 Anxiety* SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		
			Typical & PD	DD	Total
TB4 Anxiety	no or Not sure	Count	55	16	71
		Expected Count	55.6	15.4	71.0
	Yes	Count	46	12	58
		Expected Count	45.4	12.6	58.0
Total		Count	101	28	129
		Expected Count	101.0	28.0	129.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.064[a]	1	.800	.833	.486	
Continuity Correction[b]	.001	1	.969			
Likelihood Ratio	.064	1	.800	.833	.486	
Fisher's Exact Test				.833	.486	
Linear-by-Linear Association	.063[c]	1	.801	.833	.486	.165
N of Valid Cases	129					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.59.

b. Computed only for a 2x2 table

c. The standardized statistic is -.252.

Appendix 7g continued:

TB4 Anxiety* SSP Total Difficulties Score

Crosstab

			SSP Total Difficulties		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	34	37	71
		Expected Count	31.9	39.1	71.0
	Yes	Count	23	33	56
		Expected Count	25.1	30.9	56.0
Total		Count	57	70	127
		Expected Count	57.0	70.0	127.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.588[a]	1	.443	.476	.279	
Continuity Correction[b]	.345	1	.557			
Likelihood Ratio	.589	1	.443	.476	.279	
Fisher's Exact Test				.476	.279	
Linear-by-Linear Association	.583[c]	1	.445	.476	.279	.107
N of Valid Cases	127					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 25.13.

b. Computed only for a 2x2 table

c. The standardized statistic is .764.

Appendix 7g continued:

TB4 Anxiety* SC Auditory Difficulties

Crosstab

			SC Auditory		
			Typical & PD	DD	Total
TB4 Anxiety	no or Not sure	Count	55	23	78
		Expected Count	49.6	28.4	78.0
	Yes	Count	34	28	62
		Expected Count	39.4	22.6	62.0
Total		Count	89	51	140
		Expected Count	89.0	51.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.665[a]	1	.056	.077	.041	
Continuity Correction[b]	3.019	1	.082			
Likelihood Ratio	3.661	1	.056	.077	.041	
Fisher's Exact Test				.077	.041	
Linear-by-Linear Association	3.638[c]	1	.056	.077	.041	.023
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 22.59.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.907.

Appendix 7g continued:

Anxiety* SC Visual Difficulties

Crosstab

			SC Visual		
			Typical & PD	DD	Total
TB4 Anxiety	no or Not sure	Count	63	15	78
		Expected Count	58.5	19.5	78.0
	Yes	Count	42	20	62
		Expected Count	46.5	15.5	62.0
Total		Count	105	35	140
		Expected Count	105.0	35.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.127[a]	1	.077	.115	.058	
Continuity Correction[b]	2.470	1	.116			
Likelihood Ratio	3.113	1	.078	.115	.058	
Fisher's Exact Test				.115	.058	
Linear-by-Linear Association	3.104[c]	1	.078	.115	.058	.033
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.50.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.762.

Appendix 7g continued:

TB4 Anxiety* SC Movement Difficulties

Crosstab

			SC Movement		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	32	46	78
		Expected Count	31.2	46.8	78.0
	Yes	Count	24	38	62
		Expected Count	24.8	37.2	62.0
Total		Count	56	84	140
		Expected Count	56.0	84.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.077[a]	1	.781	.863	.459	
Continuity Correction[b]	.011	1	.917			
Likelihood Ratio	.077	1	.781	.863	.459	
Fisher's Exact Test				.863	.459	
Linear-by-Linear Association	.077[c]	1	.782	.863	.459	.133
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 24.80.

b. Computed only for a 2x2 table

c. The standardized statistic is .277.

Appendix 7g continued:

Anxiety* SC Tactile Difficulties

Crosstab

			SC Tactile		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	38	40	78
		Expected Count	37.3	40.7	78.0
	Yes	Count	29	33	62
		Expected Count	29.7	32.3	62.0
Total		Count	67	73	140
		Expected Count	67.0	73.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.052[a]	1	.819	.866	.477	
Continuity Correction[b]	.003	1	.953			
Likelihood Ratio	.052	1	.819	.866	.477	
Fisher's Exact Test				.866	.477	
Linear-by-Linear Association	.052[c]	1	.820	.866	.477	.132
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.67.

b. Computed only for a 2x2 table

c. The standardized statistic is .228.

Appendix 7g continued:

Anxiety* SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	40	38	78
		Expected Count	33.4	44.6	78.0
	Yes	Count	20	42	62
		Expected Count	26.6	35.4	62.0
Total		Count	60	80	140
		Expected Count	60.0	80.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.105[a]	1	.024	.027	.018	
Continuity Correction[b]	4.358	1	.037			
Likelihood Ratio	5.163	1	.023	.027	.018	
Fisher's Exact Test				.027	.018	
Linear-by-Linear Association	5.068[c]	1	.024	.027	.018	.011
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.57.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.251.

Appendix 7g continued:

TB4 Anxiety* SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Seek/Registration		
			Typical & PD	DD	Total
TB4 Anxiety	no or Not sure	Count	37	41	78
		Expected Count	36.8	41.2	78.0
	Yes	Count	29	33	62
		Expected Count	29.2	32.8	62.0
Total		Count	66	74	140
		Expected Count	66.0	74.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.006[a]	1	.938	1.000	.537	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.006	1	.938	1.000	.537	
Fisher's Exact Test				1.000	.537	
Linear-by-Linear Association	.006[c]	1	.938	1.000	.537	.135
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.23.

b. Computed only for a 2x2 table

c. The standardized statistic is .078.

Appendix 7g continued:

TB4 Anxiety* SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	68	10	78
		Expected Count	65.2	12.8	78.0
	Yes	Count	49	13	62
		Expected Count	51.8	10.2	62.0
Total		Count	117	23	140
		Expected Count	117.0	23.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.670[a]	1	.196	.252	.144	
Continuity Correction[b]	1.129	1	.288			
Likelihood Ratio	1.659	1	.198	.252	.144	
Fisher's Exact Test				.252	.144	
Linear-by-Linear Association	1.658[c]	1	.198	.252	.144	.080
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.19.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.288.

Appendix 7g continued:

TB4 Anxiety* SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		
			Typical & PD	DD	Total
TB4 Anxiety	no or Not sure	Count	47	31	78
		Expected Count	36.8	41.2	78.0
	Yes	Count	19	43	62
		Expected Count	29.2	32.8	62.0
Total		Count	66	74	140
		Expected Count	66.0	74.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	12.155[a]	1	.000	.001	.000	
Continuity Correction[b]	10.996	1	.001			
Likelihood Ratio	12.386	1	.000	.001	.000	
Fisher's Exact Test				.001	.000	
Linear-by-Linear Association	12.068[c]	1	.001	.001	.000	.000
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.23.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.474.

Appendix 7g continued:

Anxiety* SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	64	14	78
		Expected Count	53.5	24.5	78.0
	Yes	Count	32	30	62
		Expected Count	42.5	19.5	62.0
Total		Count	96	44	140
		Expected Count	96.0	44.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	14.850[a]	1	.000	.000	.000	
Continuity Correction[b]	13.471	1	.000			
Likelihood Ratio	14.995	1	.000	.000	.000	
Fisher's Exact Test				.000	.000	
Linear-by-Linear Association	14.744[c]	1	.000	.000	.000	.000
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.49.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.840.

Appendix 7g continued:

TB4 Anxiety* SC Total Difficulties Score

Crosstab

			SC Total Difficulties		Total
			Typical & PD	DD	
TB4 Anxiety	no or Not sure	Count	48	30	78
		Expected Count	42.9	35.1	78.0
	Yes	Count	29	33	62
		Expected Count	34.1	27.9	62.0
Total		Count	77	63	140
		Expected Count	77.0	63.0	140.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.042[a]	1	.081	.090	.058	
Continuity Correction[b]	2.475	1	.116			
Likelihood Ratio	3.047	1	.081	.090	.058	
Fisher's Exact Test				.090	.058	
Linear-by-Linear Association	3.021[c]	1	.082	.090	.058	.030
N of Valid Cases	140					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 27.90.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.738.

Appendix 7h

Frequency Tables for Associations between SDQ Subscale Emotional Difficulties and SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC	Sensory Profile School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

SDQ Emotional Difficulties* SSP Tactile Difficulties

Crosstab

			SSP Tactile		
			Typical & PD	DD	Total
SDQ Emotional Difficulties	Typical & PD	Count	70	27	97
		Expected Count	68.0	29.0	97.0
	DD	Count	24	13	37
		Expected Count	26.0	11.0	37.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.682[a]	1	.409	.527	.267	
Continuity Correction[b]	.378	1	.539			
Likelihood Ratio	.669	1	.413	.527	.267	
Fisher's Exact Test				.408	.267	
Linear-by-Linear Association	.677[c]	1	.411	.527	.267	.117
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.04.

b. Computed only for a 2x2 table

c. The standardized statistic is .823.

Appendix 7h continued:

SDQ Emotional Difficulties* SSP Taste Difficulties

Crosstab

			SSP Taste		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	69	28	97
		Expected Count	68.0	29.0	97.0
	DD	Count	25	12	37
		Expected Count	26.0	11.0	37.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.163[a]	1	.687	.833	.419	
Continuity Correction[b]	.037	1	.848			
Likelihood Ratio	.161	1	.688	.833	.419	
Fisher's Exact Test				.679	.419	
Linear-by-Linear Association	.161[c]	1	.688	.833	.419	.152
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.04.

b. Computed only for a 2x2 table

c. The standardized statistic is .402.

Appendix 7h continued:

SDQ Emotional Difficulties* SSP Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	77	20	97
		Expected Count	73.3	23.7	97.0
	DD	Count	25	13	38
		Expected Count	28.7	9.3	38.0
Total		Count	102	33	135
		Expected Count	102.0	33.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.731[a]	1	.098	.120	.078	
Continuity Correction[b]	2.045	1	.153			
Likelihood Ratio	2.618	1	.106	.120	.078	
Fisher's Exact Test				.120	.078	
Linear-by-Linear Association	2.711[c]	1	.100	.120	.078	.046
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.29.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.646.

Appendix 7h continued:

SDQ Emotional Difficulties* SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks Sensation		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	29	69	98
		Expected Count	29.8	68.2	98.0
	DD	Count	12	25	37
		Expected Count	11.2	25.8	37.0
Total		Count	41	94	135
		Expected Count	41.0	94.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.102[a]	1	.749	.834	.451	
Continuity Correction[b]	.012	1	.912			
Likelihood Ratio	.102	1	.750	.834	.451	
Fisher's Exact Test				.834	.451	
Linear-by-Linear Association	.102[c]	1	.750	.834	.451	.156
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.24.

b. Computed only for a 2x2 table

c. The standardized statistic is -.319.

Appendix 7h continued:

SDQ Emotional Difficulties* SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	30	66	96
		Expected Count	29.6	66.4	96.0
	DD	Count	11	26	37
		Expected Count	11.4	25.6	37.0
Total		Count	41	92	133
		Expected Count	41.0	92.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.029[a]	1	.865	1.000	.520	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.029	1	.865	1.000	.520	
Fisher's Exact Test				1.000	.520	
Linear-by-Linear Association	.029[c]	1	.865	1.000	.520	.164
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.41.

b. Computed only for a 2x2 table

c. The standardized statistic is .169.

Appendix 7h continued:

SDQ Emotional Difficulties* SSP Low Energy

Crosstab

			SSP Low Energy		
			Typical & PD	DD	Total
SDQ Emotional Difficulties	Typical & PD	Count	72	24	96
		Expected Count	67.1	28.9	96.0
	DD	Count	21	16	37
		Expected Count	25.9	11.1	37.0
Total		Count	93	40	133
		Expected Count	93.0	40.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.227[a]	1	.040	.057	.034	
Continuity Correction[b]	3.404	1	.065			
Likelihood Ratio	4.076	1	.044	.057	.034	
Fisher's Exact Test				.057	.034	
Linear-by-Linear Association	4.195[c]	1	.041	.057	.034	.021
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.13.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.048.

Appendix 7h continued:

SDQ Emotional Difficulties* SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		
			Typical & PD	DD	Total
SDQ Emotional Difficulties	Typical & PD	Count	77	19	96
		Expected Count	74.3	21.7	96.0
	DD	Count	26	11	37
		Expected Count	28.7	8.3	37.0
Total		Count	103	30	133
		Expected Count	103.0	30.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.510[a]	1	.219	.250	.159	
Continuity Correction[b]	.995	1	.319			
Likelihood Ratio	1.454	1	.228	.250	.159	
Fisher's Exact Test				.250	.159	
Linear-by-Linear Association	1.499[c]	1	.221	.250	.159	.085
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.35.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.224.

Appendix 7h continued:

SDQ Emotional Difficulties* SSP Total Difficulties Score

Crosstab

			SSP Total Difficulties		
			Typical & PD	DD	Total
SDQ Emotional Difficulties	Typical & PD	Count	47	47	94
		Expected Count	42.3	51.7	94.0
	DD	Count	12	25	37
		Expected Count	16.7	20.3	37.0
Total		Count	59	72	131
		Expected Count	59.0	72.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.310[a]	1	.069	.081	.051	
Continuity Correction[b]	2.638	1	.104			
Likelihood Ratio	3.374	1	.066	.081	.051	
Fisher's Exact Test				.081	.051	
Linear-by-Linear Association	3.285[c]	1	.070	.081	.051	.030
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.66.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.812.

Appendix 7h continued:

SDQ Emotional Difficulties* SC Auditory Difficulties

Crosstab

			SC Auditory		
			Typical & PD	DD	Total
SDQ Emotional Difficulties	Typical & PD	Count	74	31	105
		Expected Count	67.1	37.9	105.0
	DD	Count	18	21	39
		Expected Count	24.9	14.1	39.0
Total		Count	92	52	144
		Expected Count	92.0	52.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.292[a]	1	.007	.011	.007	
Continuity Correction[b]	6.276	1	.012			
Likelihood Ratio	7.110	1	.008	.011	.007	
Fisher's Exact Test				.011	.007	
Linear-by-Linear Association	7.241[c]	1	.007	.011	.007	.004
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.08.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.691.

Appendix 7h continued:

SDQ Emotional Difficulties* SC Visual Difficulties

Crosstab

			SC Visual		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	83	22	105
		Expected Count	78.8	26.3	105.0
	DD	Count	25	14	39
		Expected Count	29.3	9.8	39.0
Total		Count	108	36	144
		Expected Count	108.0	36.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.388[a]	1	.066	.083	.054	
Continuity Correction[b]	2.637	1	.104			
Likelihood Ratio	3.234	1	.072	.083	.054	
Fisher's Exact Test				.083	.054	
Linear-by-Linear Association	3.364[c]	1	.067	.083	.054	.033
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.75.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.834.

Appendix 7h continued:

SDQ Emotional Difficulties* SC Movement Difficulties

Crosstab

			SC Movement		
			Typical & PD	DD	Total
SDQ Emotional Difficulties	Typical & PD	Count	43	62	105
		Expected Count	43.0	62.0	105.0
	DD	Count	16	23	39
		Expected Count	16.0	23.0	39.0
Total		Count	59	85	144
		Expected Count	59.0	85.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.000[a]	1	.994	1.000	.570	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.000	1	.994	1.000	.570	
Fisher's Exact Test				1.000	.570	
Linear-by-Linear Association	.000[c]	1	.994	1.000	.570	.151
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.98.

b. Computed only for a 2x2 table

c. The standardized statistic is -.008.

Appendix 7h continued:

SDQ Emotional Difficulties* SC Tactile Difficulties

Crosstab

			SC Tactile		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	51	54	105
		Expected Count	50.3	54.7	105.0
	DD	Count	18	21	39
		Expected Count	18.7	20.3	39.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.067[a]	1	.796	.852	.472	
Continuity Correction[b]	.005	1	.944			
Likelihood Ratio	.067	1	.796	.852	.472	
Fisher's Exact Test				.852	.472	
Linear-by-Linear Association	.066[c]	1	.797	.852	.472	.144
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.69.

b. Computed only for a 2x2 table

c. The standardized statistic is .257.

Appendix 7h continued:

SDQ Emotional Difficulties* SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	53	52	105
		Expected Count	46.7	58.3	105.0
	DD	Count	11	28	39
		Expected Count	17.3	21.7	39.0
Total		Count	64	80	144
		Expected Count	64.0	80.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.713[a]	1	.017	.023	.013	
Continuity Correction[b]	4.846	1	.028			
Likelihood Ratio	5.893	1	.015	.023	.013	
Fisher's Exact Test				.023	.013	
Linear-by-Linear Association	5.673[c]	1	.017	.023	.013	.009
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.33.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.382.

Appendix 7h continued:

SDQ Emotional Difficulties* SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Seeking/Registration		
			Typical & PD	DD	Total
SDQ Emotional Difficulties	Typical & PD	Count	51	54	105
		Expected Count	50.3	54.7	105.0
	DD	Count	18	21	39
		Expected Count	18.7	20.3	39.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.067[a]	1	.796	.852	.472	
Continuity Correction[b]	.005	1	.944			
Likelihood Ratio	.067	1	.796	.852	.472	
Fisher's Exact Test				.852	.472	
Linear-by-Linear Association	.066[c]	1	.797	.852	.472	.144
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.69.

b. Computed only for a 2x2 table

c. The standardized statistic is .257.

Appendix 7h continued:

SDQ Emotional Difficulties* SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	88	17	105
		Expected Count	88.2	16.8	105.0
	DD	Count	33	6	39
		Expected Count	32.8	6.2	39.0
Total		Count	121	23	144
		Expected Count	121.0	23.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.014[a]	1	.907	1.000	.565	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.014	1	.906	1.000	.565	
Fisher's Exact Test				1.000	.565	
Linear-by-Linear Association	.014[c]	1	.907	1.000	.565	.202
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.23.

b. Computed only for a 2x2 table

c. The standardized statistic is -.117.

Appendix 7h continued:

SDQ Emotional Difficulties* SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	58	47	105
		Expected Count	49.6	55.4	105.0
	DD	Count	10	29	39
		Expected Count	18.4	20.6	39.0
Total		Count	68	76	144
		Expected Count	68.0	76.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	9.995[a]	1	.002	.002	.001	
Continuity Correction[b]	8.843	1	.003			
Likelihood Ratio	10.372	1	.001	.002	.001	
Fisher's Exact Test				.002	.001	
Linear-by-Linear Association	9.926[c]	1	.002	.002	.001	.001
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.42.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.151.

Appendix 7h continued:

SDQ Emotional Difficulties* SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	83	22	105
		Expected Count	71.5	33.5	105.0
	DD	Count	15	24	39
		Expected Count	26.5	12.5	39.0
Total		Count	98	46	144
		Expected Count	98.0	46.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	21.547[a]	1	.000	.000	.000	
Continuity Correction[b]	19.721	1	.000			
Likelihood Ratio	20.650	1	.000	.000	.000	
Fisher's Exact Test				.000	.000	
Linear-by-Linear Association	21.397[c]	1	.000	.000	.000	.000
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.46.

b. Computed only for a 2x2 table

c. The standardized statistic is 4.626.

Appendix 7h continued:

SDQ Emotional Difficulties* SC Total Difficulties Score

Crosstab

			SC Total Difficulties		Total
			Typical & PD	DD	
SDQ Emotional Difficulties	Typical & PD	Count	64	41	105
		Expected Count	58.3	46.7	105.0
	DD	Count	16	23	39
		Expected Count	21.7	17.3	39.0
Total		Count	80	64	144
		Expected Count	80.0	64.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.573[a]	1	.032	.039	.026	
Continuity Correction[b]	3.802	1	.051			
Likelihood Ratio	4.561	1	.033	.039	.026	
Fisher's Exact Test				.039	.026	
Linear-by-Linear Association	4.541[c]	1	.033	.039	.026	.016
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.33.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.131.

Appendix 7i

Frequency Tables for Associations between SDQ Subscale Conduct Difficulties and SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC	Sensory Profile School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

SDQ Conduct Difficulties* SSP Tactile Difficulties

Crosstab

			SSP Tactile		
			Typical & PD	DD	Total
SDQ Conduct Difficulties	Typical & PD	Count	48	18	66
		Expected Count	46.3	19.7	66.0
	DD	Count	46	22	68
		Expected Count	47.7	20.3	68.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.413[a]	1	.521	.574	.325	
Continuity Correction[b]	.206	1	.650			
Likelihood Ratio	.413	1	.520	.574	.325	
Fisher's Exact Test				.574	.325	
Linear-by-Linear Association	.410[c]	1	.522	.574	.325	.122
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.70.

b. Computed only for a 2x2 table

c. The standardized statistic is .640.

Appendix 7i continued:

SDQ Conduct Difficulties* SSP Taste Difficulties

Crosstab

			SSP Taste		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	48	18	66
		Expected Count	46.3	19.7	66.0
	DD	Count	46	22	68
		Expected Count	47.7	20.3	68.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.413[a]	1	.521	.574	.325	
Continuity Correction[b]	.206	1	.650			
Likelihood Ratio	.413	1	.520	.574	.325	
Fisher's Exact Test				.574	.325	
Linear-by-Linear Association	.410[c]	1	.522	.574	.325	.122
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.70.

b. Computed only for a 2x2 table

c. The standardized statistic is .640.

Appendix 7i continued:

SDQ Conduct Difficulties* SSP Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	52	14	66
		Expected Count	49.9	16.1	66.0
	DD	Count	50	19	69
		Expected Count	52.1	16.9	69.0
Total		Count	102	33	135
		Expected Count	102.0	33.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.730[a]	1	.393	.428	.257	
Continuity Correction[b]	.428	1	.513			
Likelihood Ratio	.733	1	.392	.428	.257	
Fisher's Exact Test				.428	.257	
Linear-by-Linear Association	.725[c]	1	.394	.428	.257	.111
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.13.

b. Computed only for a 2x2 table

c. The standardized statistic is .852.

Appendix 7i continued:

SDQ Conduct Difficulties* SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks Sensation		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	26	40	66
		Expected Count	20.0	46.0	66.0
	DD	Count	15	54	69
		Expected Count	21.0	48.0	69.0
Total		Count	41	94	135
		Expected Count	41.0	94.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.972[a]	1	.026	.039	.020	
Continuity Correction[b]	4.172	1	.041			
Likelihood Ratio	5.014	1	.025	.039	.020	
Fisher's Exact Test				.039	.020	
Linear-by-Linear Association	4.935[c]	1	.026	.039	.020	.013
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.04.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.222.

Appendix 7i continued:

SDQ Conduct Difficulties* SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	23	43	66
		Expected Count	20.3	45.7	66.0
	DD	Count	18	49	67
		Expected Count	20.7	46.3	67.0
Total		Count	41	92	133
		Expected Count	41.0	92.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.994[a]	1	.319	.352	.209	
Continuity Correction[b]	.655	1	.419			
Likelihood Ratio	.995	1	.318	.352	.209	
Fisher's Exact Test				.352	.209	
Linear-by-Linear Association	.986[c]	1	.321	.352	.209	.091
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.35.

b. Computed only for a 2x2 table

c. The standardized statistic is .993.

Appendix 7i continued:

SDQ Conduct Difficulties* SSP Low Energy

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	42	23	65
		Expected Count	45.5	19.5	65.0
	DD	Count	51	17	68
		Expected Count	47.5	20.5	68.0
Total		Count	93	40	133
		Expected Count	93.0	40.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.704[a]	1	.192	.256	.132	
Continuity Correction[b]	1.246	1	.264			
Likelihood Ratio	1.708	1	.191	.256	.132	
Fisher's Exact Test				.256	.132	
Linear-by-Linear Association	1.691[c]	1	.193	.256	.132	.065
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.55.

b. Computed only for a 2x2 table

c. The standardized statistic is -1.301.

Appendix 7i continued:

SDQ Conduct Difficulties* SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		
			Typical & PD	DD	Total
SDQ Conduct Difficulties	Typical & PD	Count	51	15	66
		Expected Count	51.1	14.9	66.0
	DD	Count	52	15	67
		Expected Count	51.9	15.1	67.0
Total		Count	103	30	133
		Expected Count	103.0	30.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.002[a]	1	.963	1.000	.564	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.002	1	.963	1.000	.564	
Fisher's Exact Test				1.000	.564	
Linear-by-Linear Association	.002[c]	1	.963	1.000	.564	.164
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.89.

b. Computed only for a 2x2 table

c. The standardized statistic is -.047.

Appendix 7i continued:

SDQ Conduct Difficulties* SSP Total Difficulties Score

Crosstab

			SSP Total Difficulties		
			Typical & PD	DD	Total
SDQ Conduct Difficulties	Typical & PD	Count	30	35	65
		Expected Count	29.3	35.7	65.0
	DD	Count	29	37	66
		Expected Count	29.7	36.3	66.0
Total		Count	59	72	131
		Expected Count	59.0	72.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.065[a]	1	.799	.861	.468	
Continuity Correction[b]	.006	1	.937			
Likelihood Ratio	.065	1	.799	.861	.468	
Fisher's Exact Test				.861	.468	
Linear-by-Linear Association	.064[c]	1	.800	.861	.468	.135
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.27.

b. Computed only for a 2x2 table

c. The standardized statistic is .254.

Appendix 7i continued:

SDQ Conduct Difficulties* SC Auditory Difficulties

Crosstab

			SC Auditory		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	44	26	70
		Expected Count	44.7	25.3	70.0
	DD	Count	48	26	74
		Expected Count	47.3	26.7	74.0
Total		Count	92	52	144
		Expected Count	92.0	52.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.063[a]	1	.802	.863	.469	
Continuity Correction[b]	.006	1	.939			
Likelihood Ratio	.063	1	.802	.863	.469	
Fisher's Exact Test				.863	.469	
Linear-by-Linear Association	.062[c]	1	.803	.863	.469	.133
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 25.28.

b. Computed only for a 2x2 table

c. The standardized statistic is -.250.

Appendix 7i continued:

SDQ Conduct Difficulties* SC Visual Difficulties

Crosstab

			SC Visual		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	54	16	70
		Expected Count	52.5	17.5	70.0
	DD	Count	54	20	74
		Expected Count	55.5	18.5	74.0
Total		Count	108	36	144
		Expected Count	108.0	36.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.334[a]	1	.564	.701	.351	
Continuity Correction[b]	.148	1	.700			
Likelihood Ratio	.334	1	.563	.571	.351	
Fisher's Exact Test				.701	.351	
Linear-by-Linear Association	.331[c]	1	.565	.701	.351	.130
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.50.

b. Computed only for a 2x2 table

c. The standardized statistic is .576.

Appendix 7i continued:

SDQ Conduct Difficulties* SC Movement Difficulties

Crosstab

			SC Movement		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	31	39	70
		Expected Count	28.7	41.3	70.0
	DD	Count	28	46	74
		Expected Count	30.3	43.7	74.0
Total		Count	59	85	144
		Expected Count	59.0	85.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.618[a]	1	.432	.499	.269	
Continuity Correction[b]	.381	1	.537			
Likelihood Ratio	.619	1	.432	.499	.269	
Fisher's Exact Test				.499	.269	
Linear-by-Linear Association	.614[c]	1	.433	.499	.269	.099
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 28.68.

b. Computed only for a 2x2 table

c. The standardized statistic is .784.

Appendix 7i continued:

SDQ Conduct Difficulties* SC Tactile Difficulties

Crosstab

			SC Tactile		
			Typical & PD	DD	Total
SDQ Conduct Difficulties	Typical & PD	Count	40	30	70
		Expected Count	33.5	36.5	70.0
	DD	Count	29	45	74
		Expected Count	35.5	38.5	74.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.646[a]	1	.031	.045	.023	
Continuity Correction[b]	3.955	1	.047			
Likelihood Ratio	4.670	1	.031	.045	.023	
Fisher's Exact Test				.045	.023	
Linear-by-Linear Association	4.614[c]	1	.032	.045	.023	.013
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 33.54.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.148.

Appendix 7i continued:

SDQ Conduct Difficulties* SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	39	31	70
		Expected Count	31.1	38.9	70.0
	DD	Count	25	49	74
		Expected Count	32.9	41.1	74.0
Total		Count	64	80	144
		Expected Count	64.0	80.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.007[a]	1	.008	.012	.006	
Continuity Correction[b]	6.147	1	.013			
Likelihood Ratio	7.061	1	.008	.012	.006	
Fisher's Exact Test				.012	.006	
Linear-by-Linear Association	6.958[c]	1	.008	.012	.006	.004
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 31.11.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.638.

Appendix 7i continued:

SDQ Conduct Difficulties* SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Seeking/Registration		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	40	30	70
		Expected Count	33.5	36.5	70.0
	DD	Count	29	45	74
		Expected Count	35.5	38.5	74.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.646[a]	1	.031	.045	.023	
Continuity Correction[b]	3.955	1	.047			
Likelihood Ratio	4.670	1	.031	.045	.023	
Fisher's Exact Test				.045	.023	
Linear-by-Linear Association	4.614[c]	1	.032	.045	.023	.013
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 33.54.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.148.

Appendix 7i continued:

SDQ Conduct Difficulties* SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	64	6	70
		Expected Count	58.8	11.2	70.0
	DD	Count	57	17	74
		Expected Count	62.2	11.8	74.0
Total		Count	121	23	144
		Expected Count	121.0	23.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.559[a]	1	.018	.023	.016	
Continuity Correction[b]	4.538	1	.033			
Likelihood Ratio	5.776	1	.016	.023	.016	
Fisher's Exact Test				.023	.016	
Linear-by-Linear Association	5.520[c]	1	.019	.023	.016	.011
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.18.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.350.

Appendix 7i continued:

SDQ Conduct Difficulties* SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	36	34	70
		Expected Count	33.1	36.9	70.0
	DD	Count	32	42	74
		Expected Count	34.9	39.1	74.0
Total		Count	68	76	144
		Expected Count	68.0	76.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.967[a]	1	.325	.404	.207	
Continuity Correction[b]	.666	1	.414			
Likelihood Ratio	.968	1	.325	.404	.207	
Fisher's Exact Test				.404	.207	
Linear-by-Linear Association	.960[c]	1	.327	.404	.207	.082
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 33.06.

b. Computed only for a 2x2 table

c. The standardized statistic is .980.

Appendix 7i continued:

SDQ Conduct Difficulties* SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		Total
			Typical & PD	DD	
SDQ Conduct Difficulties	Typical & PD	Count	39	31	70
		Expected Count	47.6	22.4	70.0
	DD	Count	59	15	74
		Expected Count	50.4	23.6	74.0
Total		Count	98	46	144
		Expected Count	98.0	46.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	9.543[a]	1	.002	.002	.002	
Continuity Correction[b]	8.470	1	.004			
Likelihood Ratio	9.683	1	.002	.002	.002	
Fisher's Exact Test				.002	.002	
Linear-by-Linear Association	9.477[c]	1	.002	.002	.002	.001
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 22.36.

b. Computed only for a 2x2 table

c. The standardized statistic is -3.078.

Appendix 7i continued:

SDQ Conduct Difficulties* SC Total Difficulties Score

Crosstab

			SC Total Difficulties		
			Typical & PD	DD	Total
SDQ Conduct Difficulties	Typical & PD	Count	44	26	70
		Expected Count	38.9	31.1	70.0
	DD	Count	36	38	74
		Expected Count	41.1	32.9	74.0
Total		Count	80	64	144
		Expected Count	80.0	64.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.941[a]	1	.086	.096	.061	
Continuity Correction[b]	2.394	1	.122			
Likelihood Ratio	2.954	1	.086	.096	.061	
Fisher's Exact Test				.096	.061	
Linear-by-Linear Association	2.921[c]	1	.087	.096	.061	.031
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 31.11.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.709.

Appendix 7j

Frequency Tables for Associations between SDQ Subscale Hyperactive and SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC	Sensory Profile School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

SDQ Hyperactive * SSP Tactile Difficulties

Crosstab

			SSP Tactile		
			Typical & PD	DD	Total
SDQ Hyperactive	Typical & PD	Count	23	11	34
		Expected Count	23.9	10.1	34.0
	DD	Count	71	29	100
		Expected Count	70.1	29.9	100.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.136[a]	1	.712	.829	.434	
Continuity Correction[b]	.023	1	.879			
Likelihood Ratio	.135	1	.713	.829	.434	
Fisher's Exact Test				.829	.434	
Linear-by-Linear Association	.135[c]	1	.713	.829	.434	.158
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.15.

b. Computed only for a 2x2 table

c. The standardized statistic is -.368.

Appendix 7j continued:

SDQ Hyperactive * SSP Taste Difficulties

Crosstab

			SSP Taste		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	20	14	34
		Expected Count	23.9	10.1	34.0
	DD	Count	74	26	100
		Expected Count	70.1	29.9	100.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.791[a]	1	.095	.128	.075	
Continuity Correction[b]	2.113	1	.146			
Likelihood Ratio	2.690	1	.101	.128	.075	
Fisher's Exact Test				.128	.075	
Linear-by-Linear Association	2.770[c]	1	.096	.128	.075	.043
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.15.

b. Computed only for a 2x2 table

c. The standardized statistic is -1.664.

Appendix 7j continued:

SDQ Hyperactive * SSP Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	25	9	34
		Expected Count	25.7	8.3	34.0
	DD	Count	77	24	101
		Expected Count	76.3	24.7	101.0
Total		Count	102	33	135
		Expected Count	102.0	33.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.101[a]	1	.751	.818	.458	
Continuity Correction[b]	.008	1	.931			
Likelihood Ratio	.100	1	.752	.818	.458	
Fisher's Exact Test				.818	.458	
Linear-by-Linear Association	.100[c]	1	.752	.818	.458	.170
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.31.

b. Computed only for a 2x2 table

c. The standardized statistic is -.317.

Appendix 7j continued:

SDQ Hyperactive * SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks Sensation		
			Typical & PD	DD	Total
SDQ Hyperactive	Typical & PD	Count	15	20	35
		Expected Count	10.6	24.4	35.0
	DD	Count	26	74	100
		Expected Count	30.4	69.6	100.0
Total		Count	41	94	135
		Expected Count	41.0	94.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.484[a]	1	.062	.087	.051	
Continuity Correction[b]	2.732	1	.098			
Likelihood Ratio	3.357	1	.067	.087	.051	
Fisher's Exact Test				.087	.051	
Linear-by-Linear Association	3.458[c]	1	.063	.087	.051	.031
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.63.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.860.

Appendix 7j continued:

SDQ Hyperactive * SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	12	21	33
		Expected Count	10.2	22.8	33.0
	DD	Count	29	71	100
		Expected Count	30.8	69.2	100.0
Total		Count	41	92	133
		Expected Count	41.0	92.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.631[a]	1	.427	.515	.279	
Continuity Correction[b]	.333	1	.564			
Likelihood Ratio	.619	1	.432	.515	.279	
Fisher's Exact Test				.515	.279	
Linear-by-Linear Association	.626[c]	1	.429	.515	.279	.123
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.17.

b. Computed only for a 2x2 table

c. The standardized statistic is .791.

Appendix 7j continued:

SDQ Hyperactive * SSP Low Energy

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	25	9	34
		Expected Count	23.8	10.2	34.0
	DD	Count	68	31	99
		Expected Count	69.2	29.8	99.0
Total		Count	93	40	133
		Expected Count	93.0	40.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.282[a]	1	.595	.669	.382	
Continuity Correction[b]	.099	1	.753			
Likelihood Ratio	.287	1	.592	.669	.382	
Fisher's Exact Test				.669	.382	
Linear-by-Linear Association	.280[c]	1	.597	.669	.382	.152
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.23.

b. Computed only for a 2x2 table

c. The standardized statistic is .529.

Appendix 7j continued:

SDQ Hyperactive * SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	24	9	33
		Expected Count	25.6	7.4	33.0
	DD	Count	79	21	100
		Expected Count	77.4	22.6	100.0
Total		Count	103	30	133
		Expected Count	103.0	30.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.559[a]	1	.455	.477	.300	
Continuity Correction[b]	.257	1	.612			
Likelihood Ratio	.543	1	.461	.477	.300	
Fisher's Exact Test				.477	.300	
Linear-by-Linear Association	.555[c]	1	.456	.477	.300	.139
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.44.

b. Computed only for a 2x2 table

c. The standardized statistic is -.745.

Appendix 7j continued:

SDQ Hyperactive * SSP Total Difficulties Score

Crosstab

			SSP Total Difficulties		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	12	20	32
		Expected Count	14.4	17.6	32.0
	DD	Count	47	52	99
		Expected Count	44.6	54.4	99.0
Total		Count	59	72	131
		Expected Count	59.0	72.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.972[a]	1	.324	.414	.218	
Continuity Correction[b]	.611	1	.434			
Likelihood Ratio	.982	1	.322	.414	.218	
Fisher's Exact Test				.414	.218	
Linear-by-Linear Association	.965[c]	1	.326	.414	.218	.101
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.41.

b. Computed only for a 2x2 table

c. The standardized statistic is -.982.

Appendix 7j continued:

SDQ Hyperactive * SC Auditory Difficulties

Crosstab

			SC Auditory		
			Typical & PD	DD	Total
SDQ Hyperactive	Typical & PD	Count	25	12	37
		Expected Count	23.6	13.4	37.0
	DD	Count	67	40	107
		Expected Count	68.4	38.6	107.0
Total		Count	92	52	144
		Expected Count	92.0	52.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.292[a]	1	.589	.693	.369	
Continuity Correction[b]	.117	1	.732			
Likelihood Ratio	.295	1	.587	.693	.369	
Fisher's Exact Test				.693	.369	
Linear-by-Linear Association	.290[c]	1	.590	.693	.369	.138
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.36.

b. Computed only for a 2x2 table

c. The standardized statistic is .539.

Appendix 7j continued:

SDQ Hyperactive * SC Visual Difficulties

Crosstab

			SC Visual		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	31	6	37
		Expected Count	27.8	9.3	37.0
	DD	Count	77	30	107
		Expected Count	80.3	26.8	107.0
Total		Count	108	36	144
		Expected Count	108.0	36.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.049[a]	1	.152	.189	.111	
Continuity Correction[b]	1.467	1	.226			
Likelihood Ratio	2.185	1	.139	.189	.111	
Fisher's Exact Test				.189	.111	
Linear-by-Linear Association	2.035[c]	1	.154	.189	.111	.066
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.25.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.426.

Appendix 7j continued:

SDQ Hyperactive * SC Movement Difficulties

Crosstab

			SC Movement		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	23	14	37
		Expected Count	15.2	21.8	37.0
	DD	Count	36	71	107
		Expected Count	43.8	63.2	107.0
Total		Count	59	85	144
		Expected Count	59.0	85.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	9.245[a]	1	.002	.003	.002	
Continuity Correction[b]	8.103	1	.004			
Likelihood Ratio	9.153	1	.002	.003	.002	
Fisher's Exact Test				.003	.002	
Linear-by-Linear Association	9.181[c]	1	.002	.003	.002	.002
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.16.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.030.

Appendix 7j continued:

SDQ Hyperactive * SC Tactile Difficulties

Crosstab

			SC Tactile		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	22	15	37
		Expected Count	17.7	19.3	37.0
	DD	Count	47	60	107
		Expected Count	51.3	55.7	107.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.658[a]	1	.103	.128	.075	
Continuity Correction[b]	2.072	1	.150			
Likelihood Ratio	2.666	1	.103	.128	.075	
Fisher's Exact Test				.128	.075	
Linear-by-Linear Association	2.640[c]	1	.104	.128	.075	.041
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.73.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.625.

Appendix 7j continued:

SDQ Hyperactive * SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	14	23	37
		Expected Count	16.4	20.6	37.0
	DD	Count	50	57	107
		Expected Count	47.6	59.4	107.0
Total		Count	64	80	144
		Expected Count	64.0	80.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.880[a]	1	.348	.443	.228	
Continuity Correction[b]	.557	1	.455			
Likelihood Ratio	.888	1	.346	.443	.228	
Fisher's Exact Test				.443	.228	
Linear-by-Linear Association	.874[c]	1	.350	.443	.228	.099
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.44.

b. Computed only for a 2x2 table

c. The standardized statistic is -.935.

Appendix 7j continued:

SDQ Hyperactive * SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Seeking/ Registration		
			Typical & PD	DD	Total
SDQ Hyperactive	Typical & PD	Count	26	11	37
		Expected Count	17.7	19.3	37.0
	DD	Count	43	64	107
		Expected Count	51.3	55.7	107.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	9.970[a]	1	.002	.002	.001	
Continuity Correction[b]	8.801	1	.003			
Likelihood Ratio	10.158	1	.001	.002	.001	
Fisher's Exact Test				.002	.001	
Linear-by-Linear Association	9.901[c]	1	.002	.002	.001	.001
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.73.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.147.

Appendix 7j continued:

SDQ Hyperactive * SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	34	3	37
		Expected Count	31.1	5.9	37.0
	DD	Count	87	20	107
		Expected Count	89.9	17.1	107.0
Total		Count	121	23	144
		Expected Count	121.0	23.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.295[a]	1	.130	.192	.101	
Continuity Correction[b]	1.574	1	.210			
Likelihood Ratio	2.580	1	.108	.135	.101	
Fisher's Exact Test				.192	.101	
Linear-by-Linear Association	2.279[c]	1	.131	.192	.101	.070
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.91.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.509.

Appendix 7j continued:

SDQ Hyperactive * SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	17	20	37
		Expected Count	17.5	19.5	37.0
	DD	Count	51	56	107
		Expected Count	50.5	56.5	107.0
Total		Count	68	76	144
		Expected Count	68.0	76.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.033[a]	1	.857	1.000	.505	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.033	1	.857	1.000	.505	
Fisher's Exact Test				1.000	.505	
Linear-by-Linear Association	.032[c]	1	.857	1.000	.505	.149
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.47.

b. Computed only for a 2x2 table

c. The standardized statistic is -.180.

Appendix 7j continued:

SDQ Hyperactive * SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	19	18	37
		Expected Count	25.2	11.8	37.0
	DD	Count	79	28	107
		Expected Count	72.8	34.2	107.0
Total		Count	98	46	144
		Expected Count	98.0	46.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.391[a]	1	.011	.015	.011	
Continuity Correction[b]	5.399	1	.020			
Likelihood Ratio	6.143	1	.013	.024	.011	
Fisher's Exact Test				.015	.011	
Linear-by-Linear Association	6.347[c]	1	.012	.015	.011	.007
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.82.

b. Computed only for a 2x2 table

c. The standardized statistic is -2.519.

Appendix 7j continued:

SDQ Hyperactive * SC Total Difficulties Score

Crosstab

			SC Total Difficulties		Total
			Typical & PD	DD	
SDQ Hyperactive	Typical & PD	Count	24	13	37
		Expected Count	20.6	16.4	37.0
	DD	Count	56	51	107
		Expected Count	59.4	47.6	107.0
Total		Count	80	64	144
		Expected Count	80.0	64.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.748[a]	1	.186	.250	.129	
Continuity Correction[b]	1.277	1	.258			
Likelihood Ratio	1.773	1	.183	.250	.129	
Fisher's Exact Test				.250	.129	
Linear-by-Linear Association	1.736[c]	1	.188	.250	.129	.065
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.44.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.317.

Appendix 7k

Frequency Tables for Associations between SDQ Subscale Peer Relations and SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC	Sensory Profile School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

SDQ Peer Relations* SSP Tactile Difficulties

Crosstab

			SSP Tactile		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	62	18	80
		Expected Count	56.1	23.9	80.0
	DD	Count	32	22	54
		Expected Count	37.9	16.1	54.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.123[a]	1	.024	.034	.020	
Continuity Correction[b]	4.288	1	.038			
Likelihood Ratio	5.068	1	.024	.034	.020	
Fisher's Exact Test				.034	.020	
Linear-by-Linear Association	5.084[c]	1	.024	.034	.020	.012
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.12.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.255.

Appendix 7k continued:

SDQ Peer Relations * SSP Taste Difficulties

Crosstab

			SSP Taste		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	61	19	80
		Expected Count	56.1	23.9	80.0
	DD	Count	33	21	54
		Expected Count	37.9	16.1	54.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.528[a]	1	.060	.083	.046	
Continuity Correction[b]	2.843	1	.092			
Likelihood Ratio	3.491	1	.062	.083	.046	
Fisher's Exact Test				.083	.046	
Linear-by-Linear Association	3.502[c]	1	.061	.083	.046	.027
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.12.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.871.

Appendix 7k continued:

SDQ Peer Relations * SSP Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	68	12	80
		Expected Count	60.4	19.6	80.0
	DD	Count	34	21	55
		Expected Count	41.6	13.4	55.0
Total		Count	102	33	135
		Expected Count	102.0	33.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	9.483[a]	1	.002	.002	.002	
Continuity Correction[b]	8.270	1	.004			
Likelihood Ratio	9.383	1	.002	.004	.002	
Fisher's Exact Test				.004	.002	
Linear-by-Linear Association	9.413[c]	1	.002	.002	.002	.002
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.44.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.068.

Appendix 7k continued:

SDQ Peer Relations * SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks Sensation		
			Typical & PD	DD	Total
SDQ Peer Relations	Typical & PD	Count	30	50	80
		Expected Count	24.3	55.7	80.0
	DD	Count	11	44	55
		Expected Count	16.7	38.3	55.0
Total		Count	41	94	135
		Expected Count	41.0	94.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.720[a]	1	.030	.036	.023	
Continuity Correction[b]	3.929	1	.047			
Likelihood Ratio	4.877	1	.027	.036	.023	
Fisher's Exact Test				.036	.023	
Linear-by-Linear Association	4.685[c]	1	.030	.036	.023	.014
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.70.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.165.

Appendix 7k continued:

SDQ Peer Relations * SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	28	51	79
		Expected Count	24.4	54.6	79.0
	DD	Count	13	41	54
		Expected Count	16.6	37.4	54.0
Total		Count	41	92	133
		Expected Count	41.0	92.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.944[a]	1	.163	.185	.114	
Continuity Correction[b]	1.448	1	.229			
Likelihood Ratio	1.979	1	.159	.185	.114	
Fisher's Exact Test				.185	.114	
Linear-by-Linear Association	1.930[c]	1	.165	.185	.114	.059
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.65.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.389.

Appendix 7k continued:

SDQ Peer Relations * SSP Low Energy

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	58	22	80
		Expected Count	55.9	24.1	80.0
	DD	Count	35	18	53
		Expected Count	37.1	15.9	53.0
Total		Count	93	40	133
		Expected Count	93.0	40.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.633[a]	1	.426	.446	.272	
Continuity Correction[b]	.363	1	.547			
Likelihood Ratio	.629	1	.428	.446	.272	
Fisher's Exact Test				.446	.272	
Linear-by-Linear Association	.628[c]	1	.428	.446	.272	.111
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.94.

b. Computed only for a 2x2 table

c. The standardized statistic is .793.

Appendix 7k continued:

SDQ Peer Relations * SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		
			Typical & PD	DD	Total
SDQ Peer Relations	Typical & PD	Count	66	14	80
		Expected Count	62.0	18.0	80.0
	DD	Count	37	16	53
		Expected Count	41.0	12.0	53.0
Total		Count	103	30	133
		Expected Count	103.0	30.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.938[a]	1	.087	.095	.067	
Continuity Correction[b]	2.257	1	.133			
Likelihood Ratio	2.890	1	.089	.137	.067	
Fisher's Exact Test				.095	.067	
Linear-by-Linear Association	2.916[c]	1	.088	.095	.067	.040
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.95.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.708.

Appendix 7k continued:

SDQ Peer Relations * SSP Total Difficulties Score

Crosstab

			SSP Total Diffs		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	45	34	79
		Expected Count	35.6	43.4	79.0
	DD	Count	14	38	52
		Expected Count	23.4	28.6	52.0
Total		Count	59	72	131
		Expected Count	59.0	72.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	11.431[a]	1	.001	.001	.001	
Continuity Correction[b]	10.250	1	.001			
Likelihood Ratio	11.753	1	.001	.001	.001	
Fisher's Exact Test				.001	.001	
Linear-by-Linear Association	11.344[c]	1	.001	.001	.001	.000
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 23.42.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.368.

Appendix 7k continued:

SDQ Peer Relations * SC Auditory Difficulties

Crosstab

			SC Auditory		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	63	22	85
		Expected Count	54.3	30.7	85.0
	DD	Count	29	30	59
		Expected Count	37.7	21.3	59.0
Total		Count	92	52	144
		Expected Count	92.0	52.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	9.408[a]	1	.002	.003	.002	
Continuity Correction[b]	8.357	1	.004			
Likelihood Ratio	9.383	1	.002	.003	.002	
Fisher's Exact Test				.003	.002	
Linear-by-Linear Association	9.343[c]	1	.002	.003	.002	.001
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 21.31.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.057.

Appendix 7k continued:

SDQ Peer Relations * SC Visual Difficulties

Crosstab

			SC Visual		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	67	18	85
		Expected Count	63.8	21.3	85.0
	DD	Count	41	18	59
		Expected Count	44.3	14.8	59.0
Total		Count	108	36	144
		Expected Count	108.0	36.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.618[a]	1	.203	.242	.141	
Continuity Correction[b]	1.158	1	.282			
Likelihood Ratio	1.601	1	.206	.242	.141	
Fisher's Exact Test				.242	.141	
Linear-by-Linear Association	1.606[c]	1	.205	.242	.141	.069
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.75.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.267.

Appendix 7k continued:

SDQ Peer Relations * SC Movement Difficulties

Crosstab

			SC Movement		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	43	42	85
		Expected Count	34.8	50.2	85.0
	DD	Count	16	43	59
		Expected Count	24.2	34.8	59.0
Total		Count	59	85	144
		Expected Count	59.0	85.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.932[a]	1	.005	.006	.004	
Continuity Correction[b]	6.991	1	.008			
Likelihood Ratio	8.119	1	.004	.006	.004	
Fisher's Exact Test				.006	.004	
Linear-by-Linear Association	7.877[c]	1	.005	.006	.004	.003
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 24.17.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.807.

Appendix 7k continued:

SDQ Peer Relations * SC Tactile Difficulties

Crosstab

			SC Tactile		
			Typical & PD	DD	Total
SDQ Peer Relations	Typical & PD	Count	51	34	85
		Expected Count	40.7	44.3	85.0
	DD	Count	18	41	59
		Expected Count	28.3	30.7	59.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	12.137[a]	1	.000	.001	.000	
Continuity Correction[b]	10.984	1	.001			
Likelihood Ratio	12.381	1	.000	.001	.000	
Fisher's Exact Test				.001	.000	
Linear-by-Linear Association	12.053[c]	1	.001	.001	.000	.000
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 28.27.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.472.

Appendix 7k continued:

SDQ Peer Relations * SC Classroom Behaviour Difficulties

Crosstab

			SC Behaviour		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	46	39	85
		Expected Count	37.8	47.2	85.0
	DD	Count	18	41	59
		Expected Count	26.2	32.8	59.0
Total		Count	64	80	144
		Expected Count	64.0	80.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.862[a]	1	.005	.006	.004	
Continuity Correction[b]	6.935	1	.008			
Likelihood Ratio	8.004	1	.005	.006	.004	
Fisher's Exact Test				.006	.004	
Linear-by-Linear Association	7.807[c]	1	.005	.006	.004	.003
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.22.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.794.

Appendix 7k continued:

SDQ Peer Relations * SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Seeking/ Registration		
			Typical & PD	DD	Total
SDQ Peer Relations	Typical & PD	Count	50	35	85
		Expected Count	40.7	44.3	85.0
	DD	Count	19	40	59
		Expected Count	28.3	30.7	59.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	9.889[a]	1	.002	.002	.001	
Continuity Correction[b]	8.851	1	.003			
Likelihood Ratio	10.052	1	.002	.002	.001	
Fisher's Exact Test				.002	.001	
Linear-by-Linear Association	9.820[c]	1	.002	.002	.001	.001
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 28.27.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.134.

Appendix 7k continued:

SDQ Peer Relations * SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	70	15	85
		Expected Count	71.4	13.6	85.0
	DD	Count	51	8	59
		Expected Count	49.6	9.4	59.0
Total		Count	121	23	144
		Expected Count	121.0	23.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.434[a]	1	.510	.645	.338	
Continuity Correction[b]	.183	1	.669			
Likelihood Ratio	.440	1	.507	.645	.338	
Fisher's Exact Test				.645	.338	
Linear-by-Linear Association	.431[c]	1	.512	.645	.338	.150
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.42.

b. Computed only for a 2x2 table

c. The standardized statistic is -.656.

Appendix 7k continued:

SDQ Peer Relations * SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	46	39	85
		Expected Count	40.1	44.9	85.0
	DD	Count	22	37	59
		Expected Count	27.9	31.1	59.0
Total		Count	68	76	144
		Expected Count	68.0	76.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.958[a]	1	.047	.062	.034	
Continuity Correction[b]	3.311	1	.069			
Likelihood Ratio	3.988	1	.046	.062	.034	
Fisher's Exact Test				.062	.034	
Linear-by-Linear Association	3.930[c]	1	.047	.062	.034	.019
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 27.86.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.983.

Appendix 7k continued:

SDQ Peer Relations * SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		Total
			Typical & PD	DD	
SDQ Peer Relations	Typical & PD	Count	65	20	85
		Expected Count	57.8	27.2	85.0
	DD	Count	33	26	59
		Expected Count	40.2	18.8	59.0
Total		Count	98	46	144
		Expected Count	98.0	46.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.757[a]	1	.009	.011	.008	
Continuity Correction[b]	5.846	1	.016			
Likelihood Ratio	6.708	1	.010	.011	.008	
Fisher's Exact Test				.011	.008	
Linear-by-Linear Association	6.711[c]	1	.010	.011	.008	.005
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.85.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.590.

Appendix 7k continued:

SDQ Peer Relations * SC Total Difficulties Score

Crosstab

			T Total Not DD		
			Typical & PD	DD	Total
SDQ Peer Relations	Typical & PD	Count	60	25	85
		Expected Count	47.2	37.8	85.0
	DD	Count	20	39	59
		Expected Count	32.8	26.2	59.0
Total		Count	80	64	144
		Expected Count	80.0	64.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	18.987[a]	1	.000	.000	.000	
Continuity Correction[b]	17.530	1	.000			
Likelihood Ratio	19.297	1	.000	.000	.000	
Fisher's Exact Test				.000	.000	
Linear-by-Linear Association	18.855[c]	1	.000	.000	.000	.000
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.22.

b. Computed only for a 2x2 table

c. The standardized statistic is 4.342.

Appendix 7L

Frequency Tables for Associations between SDQ Total Difficulties Scores and SSP and SC Subscales.

Key:

SSP=	Short Sensory Profile
SC	Sensory Profile School Companion
PD=	Probable Difference (i.e. Probable difficulties)
DD=	Definite Difference (i.e. Difficulties)

SDQ Total Difficulties Scores * SSP Tactile Difficulties

Crosstab

			SSP Tactile		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	33	11	44
		Expected Count	30.9	13.1	44.0
	DD	Count	61	29	90
		Expected Count	63.1	26.9	90.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.736[a]	1	.391	.428	.258	
Continuity Correction[b]	.432	1	.511			
Likelihood Ratio	.750	1	.387	.428	.258	
Fisher's Exact Test				.428	.258	
Linear-by-Linear Association	.731[c]	1	.393	.428	.258	.113
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.13.

b. Computed only for a 2x2 table

c. The standardized statistic is .855.

Appendix 7L continued:

SDQ Total Difficulties Scores * SSP Taste Difficulties

Crosstab

			SSP Taste		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	32	12	44
		Expected Count	30.9	13.1	44.0
	DD	Count	62	28	90
		Expected Count	63.1	26.9	90.0
Total		Count	94	40	134
		Expected Count	94.0	40.0	134.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.208[a]	1	.648	.692	.403	
Continuity Correction[b]	.065	1	.799			
Likelihood Ratio	.210	1	.647	.692	.403	
Fisher's Exact Test				.692	.403	
Linear-by-Linear Association	.206[c]	1	.650	.692	.403	.145
N of Valid Cases	134					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.13.

b. Computed only for a 2x2 table

c. The standardized statistic is .454.

Appendix 7L continued:

SDQ Total Difficulties Scores * SSP Movement Difficulties

Crosstab

			SSP Movement		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	38	6	44
		Expected Count	33.2	10.8	44.0
	DD	Count	64	27	91
		Expected Count	68.8	22.2	91.0
Total		Count	102	33	135
		Expected Count	102.0	33.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.129[a]	1	.042	.054	.031	
Continuity Correction[b]	3.306	1	.069			
Likelihood Ratio	4.445	1	.035	.054	.031	
Fisher's Exact Test				.054	.031	
Linear-by-Linear Association	4.098[c]	1	.043	.054	.031	.021
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.76.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.024.

Appendix 7L continued:

SDQ Total Difficulties Scores * SSP Seeks Sensation Difficulties

Crosstab

			SSP Seeks Sensation		
			Typical & PD	DD	Total
SDQ Total Difficulties	Typical & PD	Count	17	27	44
		Expected Count	13.4	30.6	44.0
	DD	Count	24	67	91
		Expected Count	27.6	63.4	91.0
Total		Count	41	94	135
		Expected Count	41.0	94.0	135.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.109[a]	1	.146	.165	.106	
Continuity Correction[b]	1.569	1	.210			
Likelihood Ratio	2.067	1	.151	.165	.106	
Fisher's Exact Test				.165	.106	
Linear-by-Linear Association	2.093[c]	1	.148	.165	.106	.055
N of Valid Cases	135					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.36.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.447.

Appendix 7L continued:

SDQ Total Difficulties Scores * SSP Auditory Difficulties

Crosstab

			SSP Auditory		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	14	30	44
		Expected Count	13.6	30.4	44.0
	DD	Count	27	62	89
		Expected Count	27.4	61.6	89.0
Total		Count	41	92	133
		Expected Count	41.0	92.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.030[a]	1	.862	1.000	.507	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	.030	1	.862	1.000	.507	
Fisher's Exact Test				1.000	.507	
Linear-by-Linear Association	.030[c]	1	.862	1.000	.507	.155
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.56.

b. Computed only for a 2x2 table

c. The standardized statistic is .173.

Appendix 7L continued:

SDQ Total Difficulties Scores * SSP Low Energy

Crosstab

			SSP Low Energy		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	35	9	44
		Expected Count	30.8	13.2	44.0
	DD	Count	58	31	89
		Expected Count	62.2	26.8	89.0
Total		Count	93	40	133
		Expected Count	93.0	40.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.894[a]	1	.089	.109	.065	
Continuity Correction[b]	2.251	1	.134			
Likelihood Ratio	3.016	1	.082	.109	.065	
Fisher's Exact Test				.109	.065	
Linear-by-Linear Association	2.872[c]	1	.090	.109	.065	.038
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.23.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.695.

Appendix 7L continued:

SDQ Total Difficulties Scores * SSP Visual/Auditory Difficulties

Crosstab

			SSP Visual/Auditory		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	37	7	44
		Expected Count	34.1	9.9	44.0
	DD	Count	66	23	89
		Expected Count	68.9	20.1	89.0
Total		Count	103	30	133
		Expected Count	103.0	30.0	133.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.663[a]	1	.197	.271	.142	
Continuity Correction[b]	1.143	1	.285			
Likelihood Ratio	1.739	1	.187	.271	.142	
Fisher's Exact Test				.271	.142	
Linear-by-Linear Association	1.651[c]	1	.199	.271	.142	.079
N of Valid Cases	133					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.92.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.285.

Appendix 7L continued:

SDQ Total Difficulties Scores * SSP Total Difficulties Score

Crosstab

			SSP Total Diffs		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	21	23	44
		Expected Count	19.8	24.2	44.0
	DD	Count	38	49	87
		Expected Count	39.2	47.8	87.0
Total		Count	59	72	131
		Expected Count	59.0	72.0	131.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.194[a]	1	.660	.712	.399	
Continuity Correction[b]	.065	1	.799			
Likelihood Ratio	.193	1	.660	.712	.399	
Fisher's Exact Test				.712	.399	
Linear-by-Linear Association	.192[c]	1	.661	.712	.399	.134
N of Valid Cases	131					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.82.

b. Computed only for a 2x2 table

c. The standardized statistic is .438.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC Auditory Difficulties

Crosstab

			SC Auditory		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	35	12	47
		Expected Count	30.0	17.0	47.0
	DD	Count	57	40	97
		Expected Count	62.0	35.0	97.0
Total		Count	92	52	144
		Expected Count	92.0	52.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.385[a]	1	.066	.095	.048	
Continuity Correction[b]	2.738	1	.098			
Likelihood Ratio	3.490	1	.062	.069	.048	
Fisher's Exact Test				.095	.048	
Linear-by-Linear Association	3.361[c]	1	.067	.095	.048	.027
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.97.

b. Computed only for a 2x2 table

c. The standardized statistic is 1.833.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC Visual Difficulties

Crosstab

			SC Visual		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	41	6	47
		Expected Count	35.3	11.8	47.0
	DD	Count	67	30	97
		Expected Count	72.8	24.3	97.0
Total		Count	108	36	144
		Expected Count	108.0	36.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.570[a]	1	.018	.023	.013	
Continuity Correction[b]	4.643	1	.031			
Likelihood Ratio	6.059	1	.014	.023	.013	
Fisher's Exact Test				.023	.013	
Linear-by-Linear Association	5.531[c]	1	.019	.023	.013	.009
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.75.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.352.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC Movement Difficulties

Crosstab

			SC Movement		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	28	19	47
		Expected Count	19.3	27.7	47.0
	DD	Count	31	66	97
		Expected Count	39.7	57.3	97.0
Total		Count	59	85	144
		Expected Count	59.0	85.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	9.983[a]	1	.002	.002	.001	
Continuity Correction[b]	8.874	1	.003			
Likelihood Ratio	9.932	1	.002	.002	.001	
Fisher's Exact Test				.002	.001	
Linear-by-Linear Association	9.914[c]	1	.002	.002	.001	.001
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.26.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.149.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC Tactile Difficulties

Crosstab

			SC Tactile		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	32	15	47
		Expected Count	22.5	24.5	47.0
	DD	Count	37	60	97
		Expected Count	46.5	50.5	97.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	11.372[a]	1	.001	.001	.001	
Continuity Correction[b]	10.204	1	.001			
Likelihood Ratio	11.546	1	.001	.001	.001	
Fisher's Exact Test				.001	.001	
Linear-by-Linear Association	11.293[c]	1	.001	.001	.001	.000
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 22.52.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.361.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC Classroom Behaviour Difficulties

Crosstab

			T Behave Not DD		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	28	19	47
		Expected Count	20.9	26.1	47.0
	DD	Count	36	61	97
		Expected Count	43.1	53.9	97.0
Total		Count	64	80	144
		Expected Count	64.0	80.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.469[a]	1	.011	.013	.009	
Continuity Correction[b]	5.591	1	.018			
Likelihood Ratio	6.469	1	.011	.013	.009	
Fisher's Exact Test				.013	.009	
Linear-by-Linear Association	6.424[c]	1	.011	.013	.009	.006
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.89.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.535.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC School Factor 1 Sensory Seeking/Registration

Crosstab

			SC SF1 Seeking/ Registration		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	33	14	47
		Expected Count	22.5	24.5	47.0
	DD	Count	36	61	97
		Expected Count	46.5	50.5	97.0
Total		Count	69	75	144
		Expected Count	69.0	75.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	13.898[a]	1	.000	.000	.000	
Continuity Correction[b]	12.604	1	.000			
Likelihood Ratio	14.172	1	.000	.000	.000	
Fisher's Exact Test				.000	.000	
Linear-by-Linear Association	13.802[c]	1	.000	.000	.000	.000
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 22.52.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.715.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC School Factor 2 Attention & Awareness

Crosstab

			SC SF2 Awareness		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	40	7	47
		Expected Count	39.5	7.5	47.0
	DD	Count	81	16	97
		Expected Count	81.5	15.5	97.0
Total		Count	121	23	144
		Expected Count	121.0	23.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.060[a]	1	.806	.817	.506	
Continuity Correction[b]	.000	1	.997			
Likelihood Ratio	.061	1	.805	.817	.506	
Fisher's Exact Test				1.000	.506	
Linear-by-Linear Association	.060[c]	1	.806	.817	.506	.188
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.51.

b. Computed only for a 2x2 table

c. The standardized statistic is .245.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC School Factor 3 Tolerance for Input

Crosstab

			SC SF3 Tolerance		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	29	18	47
		Expected Count	22.2	24.8	47.0
	DD	Count	39	58	97
		Expected Count	45.8	51.2	97.0
Total		Count	68	76	144
		Expected Count	68.0	76.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.870[a]	1	.015	.020	.012	
Continuity Correction[b]	5.039	1	.025			
Likelihood Ratio	5.900	1	.015	.020	.012	
Fisher's Exact Test				.020	.012	
Linear-by-Linear Association	5.829[c]	1	.016	.020	.012	.008
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 22.19.

b. Computed only for a 2x2 table

c. The standardized statistic is 2.414.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC School Factor 4 Availability for Learning

Crosstab

			SC SF4 Availability		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	34	13	47
		Expected Count	32.0	15.0	47.0
	DD	Count	64	33	97
		Expected Count	66.0	31.0	97.0
Total		Count	98	46	144
		Expected Count	98.0	46.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.589[a]	1	.443	.455	.284	
Continuity Correction[b]	.333	1	.564			
Likelihood Ratio	.598	1	.440	.455	.284	
Fisher's Exact Test				.568	.284	
Linear-by-Linear Association	.585[c]	1	.444	.455	.284	.115
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.01.

b. Computed only for a 2x2 table

c. The standardized statistic is .765.

Appendix 7L continued:

SDQ Total Difficulties Scores * SC Total Difficulties Score

Crosstab

			SC Total Difficulties		Total
			Typical & PD	DD	
SDQ Total Difficulties	Typical & PD	Count	35	12	47
		Expected Count	26.1	20.9	47.0
	DD	Count	45	52	97
		Expected Count	53.9	43.1	97.0
Total		Count	80	64	144
		Expected Count	80.0	64.0	144.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	10.107[a]	1	.001	.002	.001	
Continuity Correction[b]	9.002	1	.003			
Likelihood Ratio	10.478	1	.001	.002	.001	
Fisher's Exact Test				.002	.001	
Linear-by-Linear Association	10.037[c]	1	.002	.002	.001	.001
N of Valid Cases	144					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.89.

b. Computed only for a 2x2 table

c. The standardized statistic is 3.168.