A Case Study Investigation into the Sensory Needs of Children and Young People with Autistic Spectrum Condition (ASC) within an Educational Context

A Thesis submitted to the University of Manchester for the degree of Doctorate in Educational and Child Psychology
In the Faculty of Humanities

2014

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Abstract

The University of Manchester
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Doctorate in Educational and Child Psychology
A case study investigation into the sensory needs of children and young people with Autistic Spectrum Condition (ASC) within an educational context
2014

A number of studies have reported that many children with Autism Spectrum Condition (ASC) experience unusual responses to sensory stimuli, however it is argued that there is a lack of conceptual understanding regarding this phenomenon and an underdeveloped evidence base regarding appropriate support for these responses within an educational context. Despite this, practitioners from a range of professions are called upon to offer consultation, advice and intervention. Therefore, the present study sought to qualitatively explore the experiences of these professionals with regards to the sensory needs of children with ASC within an educational setting.

An exploratory single-embedded case study design was adopted. Two Specialist Teachers, two Educational Psychologists (specialists in ASC) and two Occupational Therapists were recruited opportunistically and individual semi-structured interviews were conducted with each participant, resulting in six interviews. Each interview was audio recorded and transcribed verbatim. Interview data were analysed using thematic analysis and the findings presented as three thematic maps according to research question.

Six organising themes were identified for Research Question 1: conceptualisations, assessment, defining unusual sensory responses, pragmatism, impact at school and professionals’ roles. Three organising themes arose from the data for Research Question 2: interventions, differences between special and mainstream, and efficacy. The data from the interviews yielded two organising themes for Research Question 3: barriers and facilitators.

The study extends conceptual understanding by presenting a proposed Interactive Factors Framework (IFF) for unusual sensory responses in children with ASC. A number of recommendations for supporting children with ASC and unusual sensory responses within educational settings are also proposed. Implications for professionals supporting the sensory needs of children with ASC are discussed with reference to the pragmatic issues involved in translating a developing evidence base into practice.
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List of Acronyms and Abbreviations

ADHD - Attention Deficit/Hyperactivity Disorder
AIT - Auditory Integration Training
APA - American Psychiatric Association
AS - Asperger’s Syndrome
ASC - Autistic Spectrum Condition
ASD - Autism Spectrum Disorder
CAQDAS- Computer Assisted Data Analysis Software
DEdChPsychol- Doctorate in Educational and Child Psychology
DSM - Diagnostic and Statistic Manual of Mental Disorders
EBP - Evidence Based Practice
ED- Executive Dysfunction
EP - Educational Psychologist
E-S - Empathising-Systemising
FASD - Fetal Alcohol Spectrum Disorder
ICD - International Classification of Diseases
IFF- Interactive Factors Framework
IPA- Interpretive Phenomenological Analysis
IQ – Intelligence Quotient
LA- Local Authority
MSEs - Multisensory Environments
NAS - National Autistic Society
NHS- National Health Service
OT - Occupational Therapist
PBE- Practice Based Evidence
PMLD - Profound and Multiple Learning Difficulties
RQ - Research Question
SBMD - Sensory Based Motor Disorder
SDD - Sensory Discrimination Disorder
SEN- Special Educational Needs
SEQ - Sensory Experience Questionnaire
SI – Sensory Integration
SID - Sensory Integration Disorder
SIPT - Sensory Integration and Praxis Tests
SIT - Sensory Intervention Therapy
SMD - Sensory Modulation Disorder
SNAP - Special Needs and Autism Project
SOR - Sensory Overresponsivity
SPCR - Sensory Profile Checklist Revised
SPD - Sensory Processing Disorder
SPSC - Sensory Profile School Companion
SS - Sensory Seeking
SSQ-R - Sensory Sensitivity Questionnaire-Revised
SUR - Sensory Underresponsivity
TEP- Trainee Educational Psychologist
UK- United Kingdom
UOA- Unit of Analysis
WCC - Weak Central Coherence
Acknowledgments

Firstly, I would like to thank all the professionals who participated in the present research study. Without their time, commitment and insightful reflections this study would not have been possible.

I would like to thank my supervisor Dr Catherine Kelly for her inspirational support and guidance throughout the Doctorate. I have always left each tutorial with a clearer understanding of the direction I was heading and greater motivation for getting writing again. Thank you particularly for the amount of time you dedicated in the last couple of weeks as I neared the end. I’d also like to thank the rest of the University of Manchester Doctorate in Educational and Child Psychology team for their support and guidance throughout the three years of study.

I would like to thank the 2011-2014 cohort of TEPs for their uncanny ability to sense when an uplifting moment was needed, their brilliant sense of humour (often involving car tyres) and, more seriously, their thought provoking reflections throughout the course. You have been an important part of my journey, thank you.

I would like to thank my mum and dad, Anne and Martin, and my sister, Jenn, for the unconditional love, support and guidance you have given to me up to and including the Doctorate. Mum, thank you for your words of encouragement, supportive phone calls and most of all your meals on wheels service during those last few weeks. Dad, thank you for all your proofreading and formatting, calm words of wisdom and support during all manner of car disasters.

Finally, to my better half, Tom, you have been a source of constant and unwavering emotional support during this Doctorate. Thank you for always knowing what to do and say to keep me on track.

Thank you everyone,
Alison
Chapter 1

Introduction

1.1 Overview of chapter

This chapter considers the context in which the present research took place and describes the rationale underlying the study. This is followed by an overview of the remaining chapters.

1.2 Context of the research

This research forms part of the present author’s professional training to qualify as an Educational Psychologist (EP) and complete a Doctorate in Educational and Child Psychology (DEdChPsychol) at The University of Manchester. The present author currently holds a bursary fieldwork position as a Trainee Educational Psychologist (TEP) within an independent company that provides educational psychology and support services to professionals working with children and young people throughout the North West of England. A substantial branch of this company involves the training of professionals working with children and young people on a wide range of topics in child development. One of the most frequently requested topics for training in the present author’s context of practice has been Autistic Spectrum Conditions\(^1\) (ASC), in particular understanding and supporting challenging behaviour. It is suggested in some literature (Reese, Richman, Zarcone, & Zarcone, 2003) that the challenging behaviours of some children with ASC can sometimes be attributed to unusual responses to sensory stimuli. Further scrutiny of the literature and discussion with colleagues indicated that unusual responses to sensory stimuli are thought to be common in children with ASC but that there was a lack of clarity regarding the nature of these responses and the evidence base for intervention.

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\(^1\) Please note that throughout this thesis plan the term Autistic Spectrum Condition (ASC) is used as opposed to Autistic Spectrum Disorder (ASD), in line with the view that 'it is less stigmatising, and it reflects that these individuals have not only disabilities that require a medical diagnosis, but also areas of cognitive strength' (pp. 500, Baron-Cohen, Ashwin, Ashwin, Tavassoli, & Chakrabarti, 2009).
1.3 Rationale and research gaps

A literature review was conducted by the present author in order to explore the research regarding unusual sensory responses\(^2\) in children with ASC within an educational context. This review highlighted:

- A lack of research investigating professionals’ experiences of unusual sensory responses in children with ASC within an educational setting.
- A lack of research utilising qualitative methodologies to investigate unusual sensory responses in children with ASC in educational settings.
- A lack of research exploring how unusual sensory responses in children with ASC are supported within educational settings and the barriers and facilitators to such support.

The present study aimed to address these research gaps by asking the following research questions (RQs):

1. What experiences and conceptualisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?

2. What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?

3. What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?

\(^2\) Please note that throughout this thesis the term ‘unusual sensory responses’ is used as opposed to ‘sensory dysfunction’, ‘sensory difficulties’ or ‘sensory abnormalities’ as the present author believes such responses represent a different, as opposed to abnormal, way of perceiving the world, in line with a strengths based approach to ASC (Baron-Cohen et al., 2009).
It is argued that the findings for RQ1 in the present study facilitate a broader and richer conceptual understanding of unusual sensory responses in children with ASC. The findings for RQ2 are argued to add to the emerging literature base regarding how the sensory needs of children with ASC can be supported in educational settings. It is put forward that the findings for RQ3 provide valuable information to practitioners regarding the barriers and facilitators of such support.

1.3 Methodology

A critical realist ontological and epistemological position was taken in the present research (Robson, 2002). The study adopted an exploratory single-embedded case study design (Yin, 2009) and had three units of analysis (UoA), which explored professionals’ experiences of a) unusual sensory responses in children with ASC in educational settings b) how these responses are supported and c) the barriers and facilitators to supporting these responses. An opportunistic approach to sampling was taken, which yielded a sample of six professionals: two Specialist Teachers (specialists in ASC), two Educational Psychologists (EPs) (specialists in ASC) and two Occupational Therapists (OTs). An individual semi structured interview was conducted with each professional. The data collected from the six interviews were analysed using Braun and Clarke’s (2006) six phase model of thematic analysis and the findings presented in three thematic maps according to research question. The research was assessed to present a low level of risk in accordance with the University of Manchester’s ethical guidelines. Ethical approval was granted on 19\textsuperscript{th} June 2013.

1.4 Overview of the thesis

The thesis is comprised of four main chapters; Literature Review, Methodology, Findings and Discussion, followed by the references and appendices. The global structure of each section is described below.
1.4.1 Literature Review

This chapter reviews the current literature on unusual sensory responses experienced by children with ASC, the impact of such responses on these children in the classroom and how the sensory needs of children with ASC can be supported in educational settings. The chapter details the methodology of the literature review first followed by a detailed account of the literature returned. This account describes and critiques the conceptual models put forward to describe unusual responses to sensory stimuli in children with ASC, examines the impact of unusual sensory responses on children with ASC in the classroom and discusses how the sensory needs of these children can be supported in educational settings. The chapter concludes with a statement regarding the identified ‘knowledge gap’, the present study’s research questions and an examination of the expected contribution to knowledge and utility of the present research.

1.4.2 Methodology

This chapter provides a comprehensive description of the present study’s methodology. The ontological, epistemological and axiological position of the research design is outlined first followed by a detailed description of the research design with reference to the study design, sampling and participant recruitment, data gathering methods and data analysis methods. The reliability and trustworthiness, ethical considerations, operational risks and timeline of the present research are then presented. The chapter concludes with a critique of the methodology, including a critical discussion of the research design, data collection method and data analysis process.

1.4.3 Findings

This chapter provides a description of the findings from the thematic analysis outlined in Chapter 3. Each research question (RQ) is taken in turn and the subthemes, basic themes and organising themes that were identified during data analysis described alongside a thematic map. All subthemes, basic themes and
organising themes are supported by direct quotes from the data set. The chapter concludes with an executive summary of the findings.

1.4.4 Discussion

This chapter provides a discussion of the findings from the present research study. A brief overview of the existing literature is presented followed by a summary of the present study’s findings. The theoretical implications of the findings and implications on professional practice are then discussed. The chapter concludes with a discussion of the limitations of the present research and recommendations for further research.
Chapter 2

Literature Review

2.1 Overview of chapter

This chapter reviews the current literature on unusual sensory responses experienced by children with Autistic Spectrum Condition (ASC), the impact of such responses on these children in the classroom and how the sensory needs of children with ASC can be supported in educational settings. The chapter will first detail the methodology of the literature review by outlining the aims of the review, the review strategy utilised and the literature returned following the implementation of this strategy. Following this, the chapter will provide a detailed account of the literature returned. This account will begin with an overview of ASC and then move on to critically discuss the research which investigates unusual sensory responses in individuals with ASC. This will be followed by a description of the conceptual models put forward to explain unusual sensory responses in individuals with ASC, including a critical evaluation of such models. The account will then move on to examine the impact of unusual sensory responses on children with ASC in the classroom and will discuss how the sensory needs of these children can be supported in educational settings. This account of the literature will lead to a statement regarding the ‘knowledge gap’ in this area and the present study’s research questions. The chapter will conclude with an examination of the expected contribution to knowledge and utility of the present research.

2.2 Methodology of the literature review

2.2.1 Aims of the literature review

As discussed in Chapter 1, the present researcher first became aware of research into the sensory needs of children with ASC whilst investigating the varying functions of challenging behaviour in children with ASC. Reese et al. (2003)
suggest that one such function of the challenging behaviour of children with ASC is to gain or reduce sensory stimulation. An initial search of the literature and discussion with academic tutors from the Doctorate in Educational and Child Psychology programme suggested that the sensory needs of children with ASC within educational settings was a relatively underresearched topic with an underdeveloped evidence base. The American Psychiatric Association (APA, 2006) guidance stresses the importance of evidence based practice (EBP) within applied psychology, therefore, the present author identified a need for a systematic review of the literature in order to more accurately determine the current state of research in this area and identify knowledge gaps in the literature.

The literature review aimed to answer the following questions:

- How are unusual sensory responses defined in the literature? What evidence is there of children with ASC experiencing unusual sensory responses?
- What impact do they have on children with ASC within an educational setting?
- How are unusual sensory responses in children with ASC supported within an educational setting? What are the barriers and facilitators of such support?

2.2.2 Review strategy

The present researcher used keyword searches on academic databases to conduct a systematic review of the literature on unusual sensory responses in children with ASC. Searches of academic databases were conducted from January 2013 to March 2014 using combinations of the following keywords: ‘autis*’, ‘pervasive developmental disorder’, ‘sensory process*’, ‘sensory modulat*’, ‘sensory integrat*’, ‘sensory profile’, ‘sensory stimul*’, ‘sensory sympt*’, ‘sensory sensitiv*’. The databases searched were PsychInfo, SAGE: Education, ERIC, Web of Knowledge and Google Scholar. Search terms were initially applied to all areas of the publications, however they were subsequently limited to title and abstract only due to the large number of irrelevant articles returned. All searches were limited to papers meeting the following criteria:
• Peer reviewed journals
• Journals written in the English language
• Journals where the full text was available electronically

The review strategy also included reference harvesting and manual searches within specific journals (Educational Psychology in Practice and Educational and Child Psychology) to locate any additional relevant research papers which met the search criteria but were not identified through the systematic literature search. Some pieces of literature were also obtained through unforeseen routes, such as personal recommendations and chance finds. Through these routes a number of pieces of ‘grey literature’ were identified, meaning literature that has not been through a rigorous peer review process (Hart, 2001). These pieces of grey literature were predominantly published books, however also included an unpublished masters dissertation, an unpublished piece of research by a previous student on the Doctorate in Educational and Child Psychology programme and an unpublished doctoral thesis.

2.3 Account of the literature

2.3.1 Overview of ASC

The National Autistic Society (NAS) defines ASC as ‘a lifelong developmental disability that affects how a person communicates with, and relates to, other people’ (NAS, 2013). The first accounts of ASC were put forward in the early 20th century using terms such as ‘early infantile autism’ (Kanner, 1943) and ‘autistic psychopaths’ (Asperger, 1938) to describe a group of children with marked behavioural similarities, such as preferring social isolation and insisting on sameness. Most professionals currently subscribe to the ‘triad of impairment’ model of autism (Wing and Gould, 1979; Wing 1988), which puts forward that individuals with ASC have impairments in social communication, social interaction and social imagination. It is this model that currently forms the foundation of the diagnostic criteria for ASC used by professionals around the world (American Psychiatric Association, 2000; World Health Organisation, 2006). There is also a
general consensus, again reflected in the diagnostic criteria, that there is a broad continuum regarding severity of impairment, known as the autistic spectrum (Rapin, 2002; Wing, 1996). For this reason a number of separate conditions are recognised under the umbrella term of ASC, for example Asperger’s Syndrome (AS). The number of people diagnosed with ASC has increased since the 1980’s, possibly as a result of changes to diagnostic practice and higher awareness of the condition in the general population (Newschaffer, Creon & Daniels, 2007; Prior, 2003; Wing & Potter, 2002). Reports estimate a prevalence of one to two cases per 1,000 people for autism and about six per 1,000 for ASC overall, with more males being diagnosed than females (NAS, 2013). More specifically for children, it has been suggested that 116 in every 10,000 children aged nine to ten years old have ASC (Baird et al., 2006) while the NAS (2013) estimates a prevalence rate of around 1 in every 100 children.

The causes of ASC are yet to be fully identified with a number of theories being put forward. The earliest theories of ASC were based upon psycho-social theories of development. One such theory was the now discredited concept of the ‘refrigerator mother’ (Bettelheim, 1967), which posited that an emotionless parenting style led to developmentally dysfunctional children. More recently, a number of cognitive theories of ASC have been reported in the literature, most notably the Mindblindness theory (Baron-Cohen, 1995; Baron-Cohen, Leslie & Frith, 1985), Empathising-Systemising theory (E-S, Baron-Cohen, 2002), Weak Central Coherence theory (WCC, Frith, 1989) and Executive Dysfunction theory (ED, Ozonoff, Pennington & Rogers, 1991). It has also been reported that ASC has a strong hereditary link (Rutter, 2000), although the genetics are argued to be complex and it is likely that multiple gene interactions are involved (Steyart & De La Marche, 2008). Other theories regarding the aetiology of ASC have included pre and perinatal trauma (Arndt, Stodgell & Rodier, 2005), childhood vaccines (now discredited, see Flaherty, 2011) and abnormal neuroanatomy (Koenig, Tsatsanis, & Volkmar, 2001; Minshew, 1996). Happé, Ronald and Plomin (2006) argue that there is ‘no single (genetic or cognitive) cause for the diverse symptoms defining autism’ (pp. 1218). Furthermore, the authors question ‘the assumption that the three impairments that define autism must be explained together’ (pp. 1218) and instead put forward it may be more fruitful to research the
triad of impairments separately in order to form conclusions regarding aetiology. Therefore, at present the causes of ASC are yet to be fully identified.

2.3.2 Unusual responses to sensory stimuli in individuals with ASC

Unusual sensory responses in individuals with ASC have been described in the literature for a number of years beginning with early clinical descriptions of ASC (Asperger, 1944; Kanner, 1943). More recently, research studies utilising empirical methodologies have provided evidence of individuals with ASC experiencing unusual responses to sensory stimuli. The following section will provide a critical overview of this research by outlining studies utilising behavioural checklists, psychophysiological and neuropsychological methodologies, and personal narratives.

2.3.2.1 Behavioural checklist studies

A number of behavioural checklists have been developed in order to assess unusual sensory responses, particularly in children. One of the most common is the Sensory Profile (Dunn, 1999), which is based on Dunn’s (1997) model of sensory processing (see Section 2.3.3.1). Using this sensory profile, significant differences in scores obtained have been found when comparing children with ASC to typically developing children, indicating a higher prevalence of unusual responses to sensory stimuli in children with ASC (Dunn, Myles and Orr, 2002; Kern et al., 2006; Kientz & Dunn, 1997; Rogers et al., 2003; Tomchek & Dunn, 2007; Watling, Dietz & White, 2001). There have also been a number of behavioural checklists designed to assess unusual sensory responses specifically in children with ASC, such as the Sensory Sensitivity Questionnaire-Revised (SSQ-R, Talay-Ongan & Wood, 2000), Sensory Experience Questionnaire (SEQ, Baranek et al., 2006) and the Sensory Profile Checklist Revised (SPCR, Bogdashina, 2003). Using the SSQ-R, Talay-Ongan & Wood (2000) found a significantly greater degree of unusual sensory responses in children with ASC when compared to typically developing children across all sensory domains (auditory, tactile, visual, gustatory and vestibular). Likewise, using the SEQ, Baranek et al. (2006) found that 69% of children with
ASC in their sample had higher scores when compared to children with developmental delay and typically developing children. Furthermore, the researchers put forward that specific sensory patterns were able to be distinguished in children with ASC. The presence of both under and overresponsivity was apparent in around 38% of children with ASC in the sample, however the researchers found that the sensory pattern that best distinguished children with ASC from the other groups was underresponsivity to sensory stimuli. Ben-Sasson et al. (2009) conducted a meta analysis of fourteen studies that utilised a behavioural checklist to investigate unusual sensory responses in children with ASC. The authors found a significant high difference in the presence of unusual sensory responses between children with ASC and typically developing children with the greatest difference being found in underresponsivity, followed by overresponsivity and sensory seeking.

However, there are a number of methodological limitations that have been raised regarding the use of behavioural checklists to investigate unusual sensory responses in children with ASC. Studies utilising behavioural checklists have been criticised on the basis that these checklists are often filled out by a parent (Baranek et al., 2006; Dunn, 1999; Dunn et al., 2002; Kern et al., 2006; Kientz & Dunn, 1997; Rogers et al., 2003; Talay-Ongan & Wood, 2000; Tomchek & Dunn, 2007; Watling et al., 2001). Parent reports are often susceptible to misattributions due to incorrect interpretation of behavioural reactions, under or over estimation of sensory difficulties and recall bias (Simmons et al., 2009). This is supported by Nader, Oberlander, Chambers and Craig (2004) who found a lack of concordance between parental reports of pain and observed pain responses in children with ASC. The authors put forward that this may be due to the inherent difficulties a parent faces when trying to understand the psychological status of their child, which lead the authors to ‘raise questions about the appropriateness of parental global report as an assessment tool’ (pp. 88). Simmons et al. (2009) also proposed that studies utilising behavioural checklists are often subject to small sample sizes and variability across groups, affecting the degree to which findings can be generalised.
2.3.2.2 Psychophysiological and neuropsychological studies

There have also been a number of studies that have employed psychophysiological measures to investigate unusual sensory responses in individuals with ASC. The majority of these studies have focused on investigating under and overresponsivity within individual sensory domains. In the sensory domain of vision, investigation has focused predominantly on overresponsivity in visual acuity (basic sensory detection thresholds) of individuals with ASC. Bertone et al. (2003) found that when compared to a control group, individuals with ASC were more accurate at identifying the orientation of first order (simple) gratings, but less accurate for second order (more complex) gratings. More recently, Ashwin, Ashwin, Rhydderch, Howells & Baron-Cohen (2009) also reported a very high mean level of visual acuity in individuals with ASC compared to controls, however methodological concerns have led to caution being recommended in the interpretation of these findings (Simmons et al., 2009). In the auditory domain, superior perception and production of pitch (Bonnel et al., 2003; Heaton, Davis, Happe, 2008; Mottron, Burack, Stauder & Robaey, 1999), auditory discrimination (O’Riordan & Passetti, 2006) and perceptual processing of speech (Jarvinen-Pasley, Wallace, Ramus, Happe & Heaton, 2002) have been found in individuals with ASC compared to controls.

There are also a number of studies that have investigated unusual sensory responses in individuals with ASC in the tactile domain. Blakemore et al. (2006) found that individuals with ASC showed overresponsivity to vibrotactile stimulation at certain thresholds when compared to controls. Furthermore, individuals with ASC have been shown to have more superior tactile acuity than controls (Tommerdahl, Tannan, Cascio, Baranek & Whitsel, 2006), although other researchers have failed to replicate this finding (O’Riordan & Passetti, 2006). Cascio et al. (2008) found that individuals with ASC showed overresponsivity to vibrations and thermal pain when compared to controls, but found no differences between groups for sensitivity to light touch and warmth/cold, suggesting that tactile sensitivity levels may be dependent on type of stimulation.
In the domain of olfaction, studies have reported both over and underresponsivity to sensory stimuli. Suzuki, Critchley, Rowe, Howlin and Murphy (2003) report impaired olfactory identification in individuals with Asperger Syndrome despite intact odour detection, a finding which was replicated in individuals with more severe ASC by Bennetto, Kuschner, and Hyman (2007). However, methodological concerns have been raised with regards to how olfactory identification was tested in these studies (Baron-Cohen, Ashwin, Ashwin, Tavassoli, & Chakrabarti, 2009). On the other hand, there are a number of studies that have found overresponsivity to olfactory stimuli in individuals with ASC (Ashwin, Ashwin, Tavassoli, Howells, Rhydderch & Baron-Cohen, submitted; Tavassoli, Ashwin, Ashwin, Chakrabarti & Baron-Cohen, submitted), supporting the view that different sensory patterns can be exhibited within an individual sensory domain (Boyd et al., 2010).

Within the literature a number of studies have also investigated the neurobiological underpinnings of unusual sensory responses in children with ASC using neuropsychological methodologies (Hardan et al., 2009; Hazen et al., 2014; Kern, 2002; Koziol et al., 2011; Marco et al., 2011; Mazurek et al., 2013). Marco et al. (2011) propose that disruptions in connectivity between discrete cortical and subcortical regions underlie unusual responses to sensory stimuli in children with ASC, in particular difficulty integrating multisensory inputs. This is supported by research which demonstrates abnormal white matter connectivity (Billeci, Calderoni, Tosetti, Catani & Muratori, 2012), decreased corpus callosum volume (Frazier & Hardan, 2009; Prigge et al., 2013) and atypical long-range firing synchrony (Just, Cherkassky, Keller, Kana & Minshew, 2007) in children with ASC. This theory is further supported by a reported correlation between decreased corpus callosum volume and unusual sensory responses in children with ASC (Hardan et al., 2009). Kern (2002) proposed that structural and cellular abnormalities in the cerebellum underlie unusual sensory responses in children with ASC, which is supported by research demonstrating that the cerebellum plays an important role in integrating and modulating sensory input (Ghelarducci, 2010). Koziol et al. (2011) also emphasise the cerebellum’s role in unusual sensory responses in
children with ASC, however they propose that they occur as a result of anomalous functioning within the interactions between the neocortex, basal ganglia and cerebellum. Disruptions in the hypothalamic-pituitary-adrenal axis and amygdala have also been put forward as neurobiological mechanisms for unusual sensory responses in children with ASC, which is supported by correlations between unusual sensory responses, gastrointestinal symptoms and anxiety in children with ASC (Mazurek et al., 2013) and amygdala abnormalities and ASC in general (Palmen, van Engeland, Hof & Schmitz, 2004; Schumann & Amaral, 2006).

However, there have been a number of concerns raised regarding the use of psychophysiological and neuropsychological methodologies to investigate unusual sensory responses in individuals with ASC. O’Neill and Jones (1997) commented that these studies often fail to take into consideration developmental and maturational effects in the selection of samples and control groups. Additionally, they question the ecological validity of studies which are carried out in highly controlled laboratory settings and therefore ‘only tell us what autistic subjects can do, as opposed to what they do’ (O’Neill & Jones, 1997, pp. 290). Furthermore, Blakemore et al. (2006) highlighted that it is often unclear which physiological level is being investigated in many studies of individuals with ASC, meaning it is still unknown whether unusual sensory responses result from differences in peripheral skin receptors, spinal synapses, the brain’s perceptual system or cognitive/emotional processes. This is supported by Robertson (2012) who argues that ‘it would appear that the sensory issues experienced by many with ASD could be far more complex than lowered thresholds; it may be the way that the brain deals with the stimuli that is of greater importance’ (pp. 71). These limitations have led to calls for further research in order to address these issues.

2.3.2.3 Self reports and personal narratives

There have been a number of self reports and personal accounts written by individuals with ASC that describe a range of unusual responses to sensory stimuli. In an anonymous internet survey of individuals with ASC it was found
that 81 per cent of respondents reported differences in visual perception, 87 per cent in hearing, 77 per cent in tactile perception, 30 per cent in taste and 56 per cent in smell (Walker & Cantello, 1994). Furthermore, a qualitative analysis of web page narratives written by individuals with ASC found common unusual sensory responses, such as aversions to being touched by others, certain sound frequencies and lights flashing at a certain frequency, and fascinations with certain smells and movements (Jones, Quigney & Huws, 2003).

A number of studies have also qualitatively explored the views of children and adolescents with ASC and their experiences of sensory stimuli. Children in Robertson’s (2012) study reported experiencing negative reactions to a range of stimuli across all five of the sensory domains, for example covering their ears when they heard something that they perceived to be particularly loud. The experience of pain was also common among the children, in particular for the visual and auditory stimuli. However, the children also described positive reactions to sensations they liked or stimuli with certain features, for example stimuli feeling smooth. It was also reported that the children preferred stimuli for which they were able to initiate contact themselves, as opposed to externally controlled stimuli. Furthermore, the study involved observing the children whilst they interacted with a range of stimuli. During these observations the children in the sample described some stimuli as being ‘annoying’, ‘uncomfortable’ and as making them feel ‘physically sick’. Observations indicated that some of the stimuli led to reactions of fear, disgust, annoyance and nausea in the children. Ashburner, Bennett, Rodger and Ziviani (2013) used a semi-structured interview protocol augmented with visual cues to explore how adolescents with ASC experienced sensory input. A number of unusual sensory responses were reported, such as high levels of sensation seeking and an over-focus on certain sensory inputs. In line with Robertson (2012), the adolescents preferred expected sensory input and perceived uncontrollable sensations to be unpleasant. Kirby, Dickie and Baranek (2014) also used an interview method to investigate the sensory experiences of children with ASC, however they used a younger sample of participants when compared to Ashburner et al. (2013). They also reported a range of unusual responses to sensory stimuli being experienced by participants and in particular highlighted the importance of
context and the multisensory nature of children’s experiences. For example, the children discussed their experiences as occurring within a particular place and time, rather than abstract interactions with sensory stimuli, and implied that sensory experiences were holistic as opposed to merely difficulties in individual sensory modalities.

There are also a number of autobiographical accounts in the literature written by individuals with ASC that describe unusual sensory responses (Grandin, 1988, 1992, 2009; Grandin & Scariano, 1986; Jackson, 2002; Williams, 1996, 1998). In particular, Temple Grandin has written extensively on her experiences of living with ASC in which a number of unusual sensory responses are described. For example for the auditory domain, she writes ‘I can shut out my hearing and withdraw from noise, but certain frequencies cannot be shut out. High pitched, shrill noises are the worst’ (Grandin, 1996). In the tactile domain, she writes ‘when I was a child I craved the feeling of being hugged but then I withdrew because I was overwhelmed by the tidal wave of sensation’ (Grandin, 1992, pp.108). In addition, Stehli (1991) describes unusual sensory responses in the olfactory domain, writing that ‘smells like deodorant and aftercare lotion, they smell so strong to me I can’t stand it, and perfume drives me nuts’ (pp. 187). A number of anecdotal reports of unusual responses to sensory stimuli in individuals with ASC, particularly from the parents of children with ASC, are also reported by Bogdashina (2003), collected during a number of years working as a teacher, lecturer and researcher in the field of ASC. These autobiographical accounts and anecdotal reports echo the research findings regarding under and overresponsivity, however also describe a broader range of unusual responses to sensory stimuli such as sensory overload, sensory tune-out, synesthesia and multi-sensory processing difficulties.

However, there have been a number of limitations discussed in relation to the use of self reports and autobiographical accounts as evidence of unusual sensory responses in individuals with ASC. Robertson (2012) highlighted a number of limitations to her research exploring the views of children with ASC and their experiences with sensory stimuli. Firstly, there was a large difference in the volume and quality of the data due to some of the children in the sample
being fairly high functioning and some of the children displaying less developed language skills, meaning their ability to communicate their own sensory experiences was restricted. Secondly, the researcher reported that on occasions some children seemed to copy the responses of others and in one particular group two children did not get on well, which led to them purposely choosing opposite options when asked to describe their experiences. Ashburner et al. (2013) noted that few examples of underresponsiveness were described by participants in their study, which they suggested could be indicative of a lack of awareness of this particular unusual sensory response, therefore preventing a holistic picture of sensory experiences being gained. Furthermore, Kirby et al. (2014) found that some participants experienced difficulty with the question-answer process during interviews, which resulted in interviewers having to use leading questions, suggest responses or consult with family members.

Criticisms regarding the reliability of autobiographical accounts have also been put forward. The majority of personal narratives have been written by high functioning individuals with ASC, which limits the generalisability of these experiences to individuals across the autistic spectrum (Simmons et al., 2009). Furthermore, O’Neill and Jones (1997) report that there are a number of personal narratives that do not reference unusual sensory responses (Carpenter, 1992; Miedzianik, 1987) and caution that ‘there is a real danger that a very small number of very prolific writers may come to influence our understanding of the autistic experience in a potentially unbalanced and unrepresentative manner’ (pp. 286). There are also accounts that have been jointly written by an individual without ASC, such as the account by Grandin and Scariano (1986), which are argued to be at risk of interpreter bias (Simmons et al., 2009). O’Neill and Jones (1997) also proposed that autobiographical accounts may be subject to bias in the form of confusion between ‘real’ and ‘echoed’ memories, meaning memories based on actual events as opposed to based on others’ descriptions (such as early childhood behaviour). In addition, Happé (1991) highlighted that the characteristics of ASC itself should be taken into account when reading firsthand accounts as these can make it difficult to ascertain the magnitude of unusual sensory
responses. These factors are argued to include a lack of empathy with the reader, tangential and perserverative writing style, idiosyncratic language use and misleading evaluation of what constitutes a typical sensory response. It is these limitations that have led researchers to warn against accepting personal narratives at face value and conclude that ‘autobiographical accounts of unusual sensory experiences provide only one source of information, and must be considered along with other indices’ (Iarocci & McDonald, 2006, pp. 79).

2.3.3 Conceptualising unusual sensory responses in individuals with ASC

There are a number of conceptual models that have been put forward to explain the phenomena of unusual responses to sensory stimuli in individuals with ASC and therefore a number of descriptive terms have arisen within the literature. This section will describe two models that are commonly referred to in the literature: Dunn’s model of sensory processing (Dunn, 1997) and Ayres’s theory of sensory integration (Ayres, 1972).

2.3.3.1 Dunn’s model

Dunn (1997) put forward a model based on the concept of ‘sensory processing’ and argues that this model can be used to aid the interpretation of young children’s behaviour. This model proposes that there is a relationship between neurological sensory thresholds and behavioural responses. Dunn (1997) argues that every individual has a neurological threshold for the level of stimulation required to register sensory stimuli. This threshold is argued to be on a continuum, meaning that a person with a low sensory threshold will react to stimuli quite often (sensitivity) and a person with a high threshold will often fail to notice stimuli (habituation). In addition, Dunn (1997) argues that every individual has a behavioural response to stimulation, again on a continuum, meaning that at one end of the continuum individuals will act in accordance with their sensory threshold and at the other end individuals will use an active strategy in order to counteract their threshold. It is posited that the interaction between these two constructs results in four patterns of sensory processing: poor registration, sensation seeking, sensitivity, and sensation avoiding (see
Figure 2.1). Individuals with poor registration appear uninterested, withdrawn and difficult to engage in interaction or learning experiences. Individuals with sensation seeking engage in behaviours to increase sensory experiences, crave sensory input and may appear impulsive or lack caution during their attempts to gain sensory stimulation. Individuals with sensitivity to stimuli appear hyperactive and distractible, have difficulty remaining on task and learning from their experiences. Individuals with sensation avoiding try to avoid activating their sensory threshold and therefore appear unwilling to participate in sensory experiences and resistant to attempts to engage them in certain activities. The model proposes that no individual utilises only one sensory processing pattern and instead argues that an individual may display different patterns for different senses, behavioural events or shifts in threshold capacity (for example being tired or rested).

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<tr>
<th>Neurological Threshold Continuum</th>
<th>Behavioral Response Continuum</th>
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<td>Responds in ACCORDANCE with threshold</td>
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<td>HIGH (habituation)</td>
<td>Poor registration</td>
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<td>LOW (sensitization)</td>
<td>Sensitivity to stimuli</td>
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Figure 2.1 Dunn’s (1997) model of sensory processing.

A number of questionnaires that are based on Dunn’s (1997) model of sensory processing have been developed and reported in the literature: The Infant/Toddler Sensory Profile, The Sensory Profile and The Adolescent/Adult Sensory Profile (Brown & Dunn, 2002; Dunn, 1999, 2002). These profiles contain statements about how an individual responds to everyday sensory stimuli and require the respondent to rate on a 5-point Likert-type scale how frequently the responses occur. For example, ‘has difficulty standing in line or
close to other people’, ‘holds hands over ears to protect ears from sound’ and ‘can’t work with background noise’. The validity and reliability of Dunn’s (1997) model of sensory processing have been investigated using these sensory profiles in studies of children and adults with and without specific disorders. It is reported in the literature that the four patterns of sensory processing were found to occur across all age groups and that individuals with specific disorders (such as ASC, attention-deficit/hyperactivity disorder, schizophrenia, Fragile X syndrome and learning difficulties) displayed more distinctive and severe patterns compared to individuals without such disorders (Brown, Cromwell, Filion, Dunn, & Tollefson, 2002; Dunn & Bennett, 2002; Dunn & Daniels, 2001; Dunn, Myles, & Orr, 2002; Dunn & Westman, 1997; Ermer & Dunn, 1998; Kientz & Dunn, 1997; McIntosh, Miller, Shyu, & Hagerman, 1999; McIntosh, Miller, Shyu, & Dunn, 1999). Therefore, Dunn (2007) argues that ‘for those who serve vulnerable children…and their families, it is important to link patterns of sensory processing to everyday life behaviours’ (pp. 88).

2.3.3.2 Ayres’s theory of sensory integration

Ayres (1972) put forward the theory of ‘sensory integration’ to describe the phenomena of unusual sensory responses in some individuals. This theory defined sensory integration as ‘the organisation of sensory information for use’ (Ayres, 1972, pp.1) and proposed that this organisation is a neurological process that enables us to make sense of the world through our senses. It was therefore hypothesised that unusual responses to sensory stimuli result from an impairment in an individual’s sensory integration, leading to the use of the term ‘Sensory Integration Disorder’ (SID). Following the development of testing tools, such as the Southern California Sensory Integration Tests (Ayres, 1972) and Sensory Integration and Praxis Test (Ayres, 1989), a series of factor-analytic studies were conducted in order to identify the components of sensory integration theory. This led to six areas of dysfunction (referred to as ‘syndromes’) and five assumptions regarding the underlying brain functions of sensory integration being proposed. These assumptions are summarised by Thompson (2011) as:
‘(1) Plasticity (the ability of the brain to reorganize neural pathways based on new experiences) exists in the central nervous system; (2) The process of sensory integration occurs in a developmental sequence and is a prerequisite for the development of higher cognitive processes; (3) The brain functions as an integrated whole, but is hierarchically organized; (4) Adaptive interactions are critical to sensory integration; and (5) There exists an inner drive to develop sensory integration through participation in sensory-motor activities’ (pp. 202).

Ayres’s (1972) sensory integration theory has gained popularity within the occupational therapy (OT) profession and many researchers and practitioners have sought to provide evidence for its validity. This has led to the evolution of a number of alternate ideas and understandings of sensory integration, meaning a number of different terms and classification models have been proposed (Pollock, 2009). Miller, Anzalone, Lane, Cermak and Osten (2007) support the theory of sensory integration, however propose the use of the term ‘Sensory Processing Disorder’ (SPD) in order to distinguish the disorder from theory. SPD is defined as ‘a group of disorders that involve challenges in modulation, integration, organisation, and discrimination of sensory input to the extent that the person does not respond appropriately to the input and experiences disruptions in daily activities and emotional behavioral patterns’ (Ben-Sasson et al., 2009, pp. 2).

Miller et al. (2007) proposed a model of classification based on Ayres’s (1972) theory that was argued to enhance the diagnostic specificity of sensory integration impairments (see Figure 2.2). This model classifies SPD as an umbrella term for three distinct patterns of sensory processing impairment: Sensory Modulation Disorder (SMD), Sensory Based Motor Disorder (SBMD), and Sensory Discrimination Disorder (SDD). The pattern of SBMD is used in this model to describe the aspects of SPD linked with motor deficits, therefore it is the SMD and SDD patterns that are most closely allied with sensory deficits. SMD is defined as a difficulty modulating neural messages resulting in an individual having responses that are inconsistent with the demands of the sensory stimulus. SDD is defined as a difficulty interpreting the qualities of sensory stimuli resulting in an individual being able to perceive a stimulus is
present and regulate their response to it, but not tell precisely what or where the stimulus is. It is proposed that each of these patterns can be further classified into a number of subtypes (see Figure 2.2). The SMD pattern of sensory processing is purported to have three subtypes: Sensory Overresponsivity (SOR), Sensory Underresponsivity (SUR), and Sensory Seeking (SS). The SDD pattern is argued to have six subtypes based on the sensory domain the individual is having difficulty discriminating stimuli within: Visual, Auditory, Tactile, Vestibular, Proprioception and Taste/Smell. There are some researchers, however, who argue that this model differs from the syndromes originally identified by Ayres (Ayres, 1972; Ayres, 1989), which has led to a proposed trademark of the term Ayres Sensory Integration© to represent an adherence to the core principles of Ayres’s original theory (Roley, Mailloux, Miller-Kuhanek & Glennon, 2007).

![SENSORY PROCESSING DISORDER (SPD)](image)

**Figure 2.2** Miller et al’s (2007) proposed classification for SPD.

**2.3.3.3 Conceptual limitations**

The previous two subsections have highlighted two of the most discussed conceptual models of unusual sensory responses within the literature (Dunn, 1997; Ayres, 1972). However, the present author argues that there are a number of constraints regarding the conceptual understanding of unusual sensory responses in individuals with ASC. These limitations focus on whether
unusual sensory responses represent a core or co-occurring phenomenon in
individuals with ASC, the lack of clarity regarding operational definitions, the
ambiguity regarding general versus domain specific sensory processing, the
lack of conceptualisations across biological, cognitive and behavioural levels
and the lack of integration between conceptualisations of unusual sensory
responses and cognitive theories of ASC in general. Each of these limitations
will now be discussed in turn.

2.3.3.3.1 Unusual sensory responses as a core or co occurring phenomenon

In the 1960s-70s it was postulated by some researchers that unusual
sensory responses could be thought of as core features of ASC (Rimland,
1964) and the theory of ‘sensory dysfunction’ was put forward (Delacato,
1974). Similar to Ayres’s (1972) theory of sensory integration, Delacato
(1974) proposed a number of distinct sensory patterns in individuals with
ASC by classifying each sensory channel as being either hypersensitive (too
much stimulation), hyposensitive (too little stimulation) or ‘white noise’
stimulation within the sensory channel that blocks stimulation from the
outside world). Delacato (1974) proposed that these sensory patterns led to
individuals with ASC having difficulty appropriately organising sensory input
in the brain, giving rise to high levels of anxiety and in turn resulting in
withdrawal from social interaction, difficulties in communication and
obsessive or compulsive behaviours (Delacato, 1974). Therefore, this theory
considered ‘sensory dysfunction’ to be the primary characteristic of ASC and
considered all other impairments to be attempts to normalise sensory
channels or communicate sensory distress.

Unusual responses to sensory stimuli were previously included as one of the
diagnostic criteria for ASC in the Diagnostic and Statistic Manual of Mental
Disorders (DSM- 3rd edition), however were removed in later editions due to
continuing debate over whether they constitute a core or co occurring
impairment (Henshall, 2008). The debate surrounding unusual sensory
responses being a core or co occurring impairment in ASC has continued in
the literature (Wing, Gould & Gillberg, 2011) and recently gained momentum
due to the new edition of the DSM (DSM-V, American Psychiatric Association, 2012). A number of theories of ASC have considered unusual sensory responses to be a core impairment of ASC, resulting in secondary impairments in the perceptual systems of individuals with ASC and therefore difficulties relating to and interacting with others (Bertone, Mottron, Jelenic & Faubert, 2003; Just, Cherkassky, Keller & Minshew, 2004; Mottorn & Burack, 2001). More recently, researchers have sought to provide empirical support for unusual sensory responses being a core impairment of ASC. Tribe (1992) reviewed a number of clinical studies that linked neuroanatomical deficits to unusual sensory responses in individuals with ASC and concluded that ‘there is enough evidence to suggest that sensory processing impairment is as central to autism as the impairments of social interaction, communication and imagination’ (pp. 141). This view has recently been echoed by Marco, Hinkley, Hill and Nagarajan (2011) who put forward that ‘as the neurophysiologic data mount, we suggest that differences in sensory processing may actually cause core features of autism such as language delay (auditory processing) and difficulty with reading emotion from faces (visual processing)’ (pp. 53).

However, it is argued that in order to qualify as a core impairment, unusual sensory responses must be present in all individuals with ASC, differ from individuals with other clinical diagnoses and differ from other core impairments, in other words be universal, unique and specific (Sigman, 1994). There are a number of researchers who have argued that these three requirements have been demonstrated in the literature and call for the reintroduction of unusual sensory responses as a core impairment in diagnostic manuals (Gillberg & Coleman, 1992). Leekham, Nieto, Libby, Wing and Gould (2007) found that 90% of children with ASC in their sample had unusual sensory responses, often in two or three different senses, regardless of age and Intelligence Quotient (IQ). Furthermore, in a recent meta analysis of the literature, Ben-Sasson et al. (2009) argue in favour of the universality of unusual sensory responses across the ASC spectrum. Unusual sensory responses have also been found to be more prevalent in individuals with ASC than other developmental disorders (Leekham et al.,
2007; Baranek, David, Poe, Stone & Watson, 2006; Ben-Sasson et al., 2009). In particular, unusual responses to auditory stimuli were found to be the single most typical feature of infants with ASC when compared to children with developmental delay (Dahlgren & Gillberg, 1989; Gillberg et al., 1990).

However, there are still a number of researchers who argue that the universality, uniqueness and specificity of unusual sensory responses in individuals with ASC remain unconfirmed. Wing et al. (2011) report that ‘odd responses to sensory input are not confined to autistic conditions and are probably not seen in absolutely all people with these conditions’ (pp. 769). Furthermore, there is limited consensus regarding the patterns of unusual sensory responses in individuals with ASC and a lack of evidence to suggest that these patterns differ in nature when compared to those demonstrated in other populations (Lane, Young, Baker & Angley, 2010). For example children with Attention Deficit/Hyperactivity Disorder (ADHD), Fragile X and other developmental delays have also been shown to have higher rates of unusual sensory responses compared to typically developing children (Ermer & Dunn, 1998; Rogers, Hepburn & Wehner, 2003). Therefore, many researchers still consider unusual sensory responses to be a co occurring impairment in ASC, as opposed to a core deficit, which is reflected in the decision to include ‘stereotyped unusual sensory behaviour’ as one type of ‘restricted repetitive patterns of behaviour’ in the DSM-V (American Psychiatric Association, 2012).

2.3.3.3.2 Lack of clarity regarding operational definitions

The present author’s review of the literature highlighted a lack of consensus regarding the operational definition of unusual sensory responses in children with ASC. Many studies have theoretical underpinnings in sensory integration and explicitly discuss their research findings with regards to the three SMD subtypes proposed by Miller et al. (2007) (Ben-Sasson et al., 2009; Boyd et al., 2010; Lane et al., 2010; Lane, Dennis & Geraghty, 2011). However, Ayres’s (1972) theory of sensory integration and Miller et al’s
(2007) proposed classification system have been criticised in the literature. Koziol et al. (2011) describe the diagnoses of SPD/SID/SMD as ‘controversial’ (pp. 786), due to the fact that none of these terms are listed within either the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) or the International Classification of Diseases (ICD-10) as a discrete diagnosis or criterion for any other diagnosis. The American Psychiatric Association (APA) also rejected SPD as a diagnosis to be included in DSM-V and requested additional research to be conducted (Flanagan, 2009). Koziol et al. (2011) also argue that ‘despite an exhaustive review of the literature, we were unable to find operational definitions that clearly and consistently separate the categories of SID/SPD/SMD. Instead we find that these terms are frequently and unfortunately used interchangeably’ (pp. 772). Furthermore, recent research conducted by James, Miller, Schaaf, Nielsen and Schoen (2011) only found evidence in support of two of the three proposed subtypes of SMD, contradicting previously proposed models (Miller et al., 2007).

As previously discussed, Dunn’s (1997) model of sensory processing, Ayres’s (1972) theory of sensory integration and Miller et al’s (2007) classification system are the main theoretical models that have been used to conceptualise unusual sensory responses in children with ASC within the literature. However, much broader conceptualisations of unusual sensory response in children with ASC can also be found, which go beyond those behaviours described by Dunn (1997), Ayres (1972) and Miller et al. (2007). For example, Bogdashina (2003) presents twenty descriptive categories that include descriptions of unusual sensory responses such as ‘gestalt perception’, ‘mono-processing’ and ‘sensory agnosia’. However, it should be noted that Bogdashina’s (2003) work is based on the personal accounts of individuals with ASC rather than empirical research. In addition, Baranek et al. (2014) summarise unusual sensory responses as:

‘under-, over- and fluctuating responsiveness to various sensory stimuli, hypo- and hypersensitivities, sensory avoidances or aversions, sensory overload, sensory seeking or craving behaviours, fascinations or
preoccupations with sensory aspects of the environments, superior acuities or enhanced perceptions, sensory integration deficits, sensory-perceptual distortions and synesthesias and other paradoxical reactions to sensory stimuli” (pp. 379).

Therefore, such variation in conceptualisations of unusual sensory responses in children with ASC has led Pollock (2009) to propose that ‘these varying perspectives reflect the difficulties in describing and defining a complex phenomena, and indicate that at present, there is no clear consensus’ (pp. 7). It also leads the present author to argue that this represents a major constraint to research investigating unusual sensory responses in individuals with ASC and makes it difficult to integrate research findings that are underpinned by different conceptual understandings.

2.3.3.3.3 General vs. domain specific sensory processing

A further conceptual constraint is the distinction between research studies investigating general sensory processing and those that investigate domain specific processing of stimuli. Research studies investigating the general sensory processing of individuals with ASC, such as those utilising behavioural checklists, tend to be allied with Dunn’s (1997) theory of sensory processing and Ayres’s (1972) theory of sensory integration. These theories are based on the assumption that the unusual sensory responses experienced by individuals with ASC are related to the way in which the brain integrates sensory information. This contrasts with research investigating domain specific processing of stimuli, such as psychophysiological studies, which lean more towards exploring the detection thresholds of individual sensory domains. These differences make it difficult to integrate the data in this area of research, which creates further barriers when attempting to conceptualise the term ‘unusual sensory responses’.
2.3.3.3.4 Lack of conceptual integration across biological, cognitive and behavioural levels

Furthermore, a considerable limitation within the literature investigating unusual sensory responses in individuals with ASC is that the nature of these responses at a biological, cognitive and behavioural level has often been considered in isolation. Morton and Frith (1995) developed a multi level framework within which causal models of developmental disorders could be expressed at a biological, cognitive and behavioural level, and likely links in the causal chain conveyed. Therefore, this framework was argued to support the integration of different theoretical perspectives on a range of difficulties within child development. The framework was later updated to take greater account of the role that the environment plays in child development (Frederickson & Cline, 2002), and termed an Interactive Factors Framework (IFF) (see Figure 2.3). IFFs are argued to allow ‘both difficulties of development and hypothesised casual influences to be described in terms of biology, cognition, behaviour and environmental factors or interactions’ (Frederickson & Cline, 2002, pp. 26). They have been used to represent theories of development for a range of child development difficulties, including dyslexia (Frith, 1997) and autism (Morton & Frith, 1995). Morton and Frith (1995) posited that ‘any coherent theory about developmental psychopathology- even one considered to be wrong- should be expressible within the framework’ (pp. 357).
Dunn’s (1997) model of sensory processing and Ayres's (1972) theory of sensory integration, describe impairments at a cognitive level with regards to sensory modulation, integration, and discrimination. Conversely, psychophysiologically studies have focused on investigating the absolute sensory detection thresholds of individuals with ASC and neuropsychological studies on the neurobiological underpinnings of unusual sensory responses. In addition, studies utilising standardised checklists of unusual sensory responses have predominantly focused on providing descriptions of unusual sensory responses at a purely behavioural level. Therefore, it is argued that at present there is a lack of a holistic conceptualisation of unusual sensory responses that accounts for and links research at a biological, cognitive and behavioural level.
2.3.3.3.5 Links between conceptualisations of unusual sensory responses and cognitive theories of ASC in general

It is also argued that the majority of literature regarding unusual sensory responses in individuals with ASC has not sought to make links between conceptualisations of these responses and cognitive theories of ASC in general. There are a number of cognitive theories of ASC reported in the literature, most notably the Mindblindness theory (Baron-Cohen, 1995; Baron-Cohen, Leslie & Frith, 1985), Empathising-Systemising theory (E-S, Baron-Cohen, 2002), Weak Central Coherence theory (WCC, Frith, 1989) and Executive Dysfunction theory (ED, Ozonoff, Pennington & Rogers, 1991). However, the present author’s literature review highlighted that unusual sensory responses have only been discussed in regards to WCC theory (Blakemore et al., 2006) and E-S theory (Baron-Cohen et al., 2009).

WCC theory puts forward that individuals with ASC have impaired global information processing meaning that individual stimuli are well analysed but not amalgamated in a coherent Gestalt (Booth, Charlton, Hughes & Happè, 2003; Frith, 1989; Happè, 1996; 1999; Jolliffe & Baron-Cohen, 2001). Therefore, it has been posited that hypersensitivity to sensory stimuli in individuals with ASC could be due to impaired top-down modulation in the brain (Frith, 2003). E-S theory posits that individuals with ASC have strengths in systemising, this being an ability to analyse and construct systems by identifying the rules that govern the system in order to predict how that system will behave (Baron-Cohen, 2006). Therefore, it has been suggested that strong systemising in individuals with ASC could be due to sensory hypersensitivity, resulting in superior attention to detail (Baron-Cohen et al., 2009). Therefore, these theories would predict hypersensitivity to all sensory stimuli in individuals with ASC, whether due to an impairment in top-down modulation or superior attention to detail (Blakemore et al., 2006). However, several studies have demonstrated hypersensitivity within certain sensory modalities, yet not in others, in individuals with ASC (Baranek et al., 2014). Furthermore, these theories do not account for other unusual sensory responses, such as hyposensitivity, that are also reported
to be experienced by individuals with ASC (Baranek et al., 2014). Therefore, at present it is unclear as to how conceptualisations of unusual sensory responses in individuals with ASC link with cognitive theories of ASC in general, in particular at the cognitive level of conceptualisation.

2.3.4 Summary of unusual sensory responses in individuals with ASC

It has been reported that unusual sensory responses are experienced by around 45-95% of individuals with ASC (Baker et al., 2008; Baranek et al., 2006; Tomcheck & Dunn, 2007). However, the present author argues that the current level of understanding with regards to these unusual sensory responses is limited due to a number of methodological and conceptual constraints within the literature. In particular, it is argued that the evidence base is, at present, conceptually unclear, with complex interactions being presented without clear proposals as to the causal links between processes at the biological, cognitive and behavioural level. The present author argues that this has led to a lack of clarity regarding an operational definition of what exactly constitute ‘unusual sensory responses’ in individuals with ASC. Notwithstanding this conceptual ambiguity regarding the operational definition of unusual sensory responses in individuals with ASC, the present author would agree with O’Neill and Jones’s (1997) statement that:

‘Bearing in mind these cautions, it appears nevertheless, that taken together there is sufficient evidence to indicate that sensory-perceptual abnormalities may be a significant feature in the lives of many people with autism, with potentially critical implications for their psychological development, and for our understanding of the nature of the disorder’ (pp. 290).

2.3.5 Unusual sensory responses of children with ASC within the classroom

The majority of research into unusual sensory responses in individuals with ASC has been conducted within a clinical or research setting. However, there are a small number of research studies that have investigated the unusual sensory responses of children with ASC within an educational setting. Such research has focused on investigating the impact of context on unusual sensory responses in children with
ASC, the educational impact of these responses and how these children can be supported within educational settings.

2.3.5.1 Investigating the impact of context on unusual sensory responses

Behaviour is argued to be influenced by the interaction between an individual and their environment (Brown & Dunn, 2010). Therefore, it is important to understand and identify unusual sensory responses within the context they occur (Dunn, 1994; Dunn, Brown, & McGuigan, 1994). Home and school contexts differ greatly and therefore it is plausible that the unusual sensory responses of children with ASC may vary between these contexts. Dunn (2006) developed the Sensory Profile School Companion (SPSC) in order to evaluate how a child’s sensory processing skills affect their behaviour and performance in the classroom. Using this questionnaire, Brown and Dunn (2010) investigated the relationship between sensory processing and context for children with ASC by comparing teachers’ ratings on the SPSC and parents’ ratings on the Sensory Profile (Dunn, 1999). The researchers found statistically significant correlations with both good and fair correlations, indicating that unusual sensory responses have universal qualities (they have the same impact regardless of context) and context specific qualities (their impact is specific to a given context, such as school) (Brown & Dunn, 2010). However, the researchers did not identify the specific sensory responses that differed between contexts and based their findings on a small sample of children with ASC. Furthermore, this study relied on the use of a standardised questionnaire involving closed questions and based on a preconceived sensory processing framework (Dunn, 1997), which it is argued may not fully capture aspects that are important to a deeper understanding of the sensory experiences of children with ASC within an educational context.

2.3.5.2 Educational impact of unusual sensory responses in the classroom

It is argued that unusual sensory responses in children with ASC can impact negatively on classroom experiences, in turn affecting academic progress and attainment (Bogdashina, 2003). Baranek (2002) puts forward that ‘many
conventional educational environments are sensorily complicated and unpredictable’ (pp. 398). Unusual sensory responses in children with ASC have been found to be associated with behavioural and emotional problems (Baker, Lane, Angley, & Young, 2008) and heightened anxiety (Pfeiffer, Kinnealey, Reed, & Herzberg, 2005), which could be argued to affect educational progress (Eaves & Ho, 1997). Ashburner et al. (2008) further explored the link between unusual sensory responses in children with ASC in the classroom and academic achievement. They reported that auditory filtering difficulties, sensory underresponsiveness and sensory seeking, measured by the Short Sensory Profile (McIntosh, Miller, Shyu, & Dunn, 1999), were correlated with poorer classroom emotional regulation, behavioural regulation and educational outcomes, measured using two teacher questionnaires: the Conner’s Teacher Rating Scale–Revised Long Version (Conners, 1997) and the Achenbach System of Empirically Based Assessment: Teacher Report Form (Achenbach & Rescorla, 2001). However, caution should be taken when interpreting these findings due to the correlational nature of the research and the fact that only intelligence and age were controlled for within the analysis. In addition, Ashburner et al. (2008), Baker et al. (2008), and Pfeiffer et al. (2005) utilised standardised questionnaires to investigate the impact of unusual sensory responses within educational settings, which as previously highlighted may not fully capture all aspects of the sensory experiences of children with ASC. Therefore, it is argued that there is a need for exploratory, qualitative research into the unusual sensory responses of children with ASC within educational settings, which is not constrained by predetermined checklists and sensory processing frameworks.

2.3.5.3 Supporting children with ASC experiencing unusual sensory responses in educational settings

The review of literature highlighted a number of interventions for supporting children with ASC experiencing unusual sensory responses in educational settings. In the present account, these interventions have been classified as either promoting changes within the child (aimed at remediating unusual sensory responses) or changes in the environment (aimed at accommodating
unusual sensory responses in the classroom). A small number of research articles were also found with regards to the role that external professionals play in supporting children with ASC within an educational setting.

2.3.5.3.1 Interventions promoting within-child change

2.3.5.3.1.1 Sensory Integration Therapy (SIT)

Sensory Integration Therapy (SIT) is based on Ayres’s (1972) theory of sensory integration, the theory that unusual sensory responses are caused by sensory stimuli being abnormally processed and integrated (Ayers, 1972; Ayers & Tickle, 1980; Schaaf & Miller, 2005). SIT therefore provides specific forms of sensory stimulation and in certain amounts in order to improve the individual’s ability to process and integrate sensory stimuli. It is argued that this improvement in functioning leads to reductions in unusual responses to sensory stimuli and more efficient learning in the classroom (Lane et al., 2010; Schaaf & Miller, 2005).

SIT activities are commonly aimed at stimulating the vestibular, proprioceptive and tactile sensory systems. Lang et al. (2012) reported that ‘implementation of SIT typically involves some combination of the child wearing a weighted vest, being brushed or rubbed with various instruments, riding a scooter board, swinging, sitting on a bouncy ball, being squeezed between exercise pads or pillows, and other similar activities’ (pp. 1005). These activities are usually delivered by an OT around one to three times per week via an individual session lasting around 30 to 60 minutes. Sessions can also be supplemented by the delivery of additional activities throughout the day by parents and members of school staff (e.g. learning support assistants) (Bundy & Murray, 2002).

SIT has been reported to be one of ‘the most common interventions delivered to children with ASD’ within occupational therapy (Lang et al., 2012, pp. 1005). Surveys of the use of SIT among OTs in the United
States have found that up to 99% regularly implement SIT (Watling, Deitz, Kanny & McLaughlin, 1999). Furthermore, around 38% of parents of children with ASC surveyed worldwide reported that their child was currently receiving SIT with an additional 33% reporting their child had previously received SIT (Green et al., 2006).

However, the efficacy of SIT for supporting the sensory needs of children with ASC has been debated within the literature. A number of meta analyses have been conducted on the use of SIT, which report varying effect sizes dependent on the population studied and outcome criteria employed (Hoehn & Baumeister, 1994; May-Benson & Koomar, 2010; Ottenbacher, 1982; Stephenson & Carter, 2005; Vargas & Camilli, 1999). More recently, a systematic review of the use of SIT focusing solely on children with ASC has been conducted (Lang et al., 2012). In this review, twenty-five studies were examined in which three suggested that SIT was effective, eight reported mixed results and fourteen found no benefits following SIT. However, of the three studies that reported positive findings (Fazlioglu & Baran, 2008; Linderman & Stewart, 1999; Thompson, 2011) all were categorised at the lowest level of certainty due to significant methodological drawbacks. These findings led the researchers to conclude that:

‘the current evidence-base does not support the use of SIT in the education and treatment of children with autism spectrum disorders (ASD). Practitioners and agencies serving children with ASD that endeavor, or are mandated, to use research-based, or scientifically-based, interventions should not use SIT outside of carefully controlled research’ (Lang et al., 2012, pp. 1004).

Alongside concerns regarding efficacy, Baranek (2002) also proposes that it is important to know whether therapeutic interventions facilitate educational progress or whether progress is hindered due to missed instruction in the classroom. The adaptation of these interventions for use within an educational setting also raises questions
regarding their fidelity and whether core therapeutic principles can still be maintained in educational settings. Therefore, Baranek (2002) argues that ‘the effects of specific sensory and motor interventions combined with various types of educational models need to be further investigated’ (pp. 417).

As well as considering the efficacy of SIT, it is also important that the feasibility of utilising interventions within educational settings is taken into consideration. Baranek (2002) argues that SIT lacks feasibility within an educational setting due to the need for specialised equipment and the anti-inclusive nature of delivery. Gilman (2005) supports this by proposing that ‘true SI therapy can only occur in a specialized clinical environment’ (pp. 213). This is due to the fact that classical SIT requires adequate space and equipment that is set up properly (e.g. suspended equipment, balls, and crash pads), as well as trained therapists to carry out the therapy. Due to the core principles of SIT, the environment must also be enticing, safe and client directed, which has led Gilman (2005) to conclude that ‘it is difficult for an occupational therapist in an education setting to provide SI therapy, due to the set-up and space limitations of school systems’ (pp. 205).

2.3.5.3.1.2 Sensory Integration-Based interventions

There are also a number of other sensory integration-based interventions that are based on Ayres’s (1972) theory, but deviate in one or more ways from classical sensory integration therapy. One such approach is the 'sensory diet' intervention, whereby a programme of sensory-based activities, based on a thorough analysis of the child’s sensory needs, is devised by an appropriate professional and implemented by key adults in the child’s life (Wilbarger, 1995). Gilman (2005, pp. 210) describes this as ‘a thoughtful, preplanned, daily routine of activities, structured to regulate arousal level and modulate sensory input’. A sensory diet in the classroom may therefore include members of school staff engaging the child in gross motor games, having the child
wear a weighted vest and allowing the child regular access to swings and outdoor equipment (Alhage-Kienz, 1996; Wilbarger, 1995; Wilbarger & Wilbarger, 1991).

Similar to SIT, issues regarding the efficacy of Sensory Integration-Based interventions have been raised (Baranek, 2002). References to the 'sensory diet' intervention (Wilbarger, 1995) were evident throughout the present author's literature review, however, very few studies investigating its effectiveness, particularly in children with ASC, were found. Furthermore, the few studies that have investigated the efficacy of Sensory Integration-Based interventions for children with ASC have been criticised due to significant methodological flaws (Baranek, 2002).

However, Sensory-Based interventions, such as the sensory diet, have been put forward as being more feasible than SIT within an educational setting as they require less equipment and are more inclusive in their method of delivery (Baranek, 2002).

2.3.5.3.1.3 Sensory stimulation techniques

Sensory stimulation techniques are another type of intervention used with children that experience unusual sensory responses. There is wide variation in these approaches, however they usually centre on providing a rigid schedule of sensory stimulation to a single sensory modality. Sensory stimulation techniques can be incorporated into Sensory-Integration Based interventions or used in complete isolation. Deep tactile pressure is reported to be a common sensory stimulation technique, which can be applied via a therapist (in the form of massage or joint compression) or apparatus (in the form pressure garments or weighted vests) (Baranek, 2002). There has also been the development of self-administrative methods of sensory stimulation, for example the Hug Machine designed by Temple Grandin (Edelson, Goldberg, Edelson, Kerr & Grandin, 1999).
However, significant methodological limitations have been discussed regarding studies which have investigated the efficacy of sensory stimulation interventions (Baranek, 2002). These concerns include the weaknesses of using case study designs (McClure & Holtz-Yotz, 1990; Ray, King, & Grandin, 1988; Zisserman, 1991), relying on numerous measures with small sample sizes (Edelson et al, 1999) and neglecting to collect physiological measures (Field et al., 1997).

2.3.5.3.1.4 Auditory Integration Training (AIT)

Auditory Integration Training (AIT, Berard, 1993) is another intervention that has been put forward as a means of remediating unusual responses to auditory stimuli in children with ASC. This intervention involves electronically filtered sounds being played through headphones and is argued to be helpful in remediating auditory hypersensitivities (Rimland & Edelson, 1995, Stehli, 1991). It is argued that AIT enhances the functioning of hair cells in the cochlea, leading to improved auditory perception and therefore fewer unusual responses to auditory stimuli (Berard, 1993). There are two alternative methodologies used in AIT: the Berard approach, using purely psychophysiological methods, and the Tomatis approach, which incorporates a psychodynamic element to the therapy (human speech) as well as psychophysiological methods. Baranek (2002) reports that the Berard approach is most commonly used in the United States, which involves ten hours of listening split into two half-hour sessions each day delivered over ten days (Sinha, Silove, Wheeler & Williams, 2006).

However, AIT has been widely criticised as an intervention due to a lack of robust empirical evidence for its effectiveness (Gravel, 1994). Studies purporting to demonstrate the effectiveness of AIT for children with ASC (Brown, 1999; Link, 1997; Neysmith-Roy, 2001; Rimland, 1995) have been criticised due to numerous methodological limitations. Furthermore, methodologically stronger studies have reported no significant differences between therapy and control groups (Bettison, 1996;
Zollweg, Palm & Vance, 1997), suggesting that any improvements made are likely to be due to factors outside of AIT, for example co-occurring educational interventions or higher expectations and attention from support staff/caregivers. Most importantly, a number of studies (Link, 1997; Mudford et al., 2000) have reported negative side effects of AIT, such as an inability to tolerate the procedure and severe behavioural difficulties post-treatment. Limitations regarding feasibility have also been applied to AIT due to the highly specialised and expensive equipment required, which can only be provided within a school setting if an AIT trainer brings the equipment with them to the school (Baranek, 2002).

2.3.5.3.1.5 Visual therapies

A number of different visual therapies have also been used to support children with ASC experiencing difficulties with visual processing and visual-spatial perception. The most common visual therapies include oculomotor exercises, ambient prism lenses and the use of coloured filters/Irlen lenses, which are usually prescribed by a specialist optometrist (Baranek, 2002). These techniques are argued to lead to improved visual perception and therefore fewer unusual responses to visual stimuli (Baranek, 2002).

However, a number of criticisms have been levelled at research investigating the efficacy of visual therapies for children with ASC. Baranek (2002) reports that there is a lack of empirical data on the use of Irlen lenses and oculomotor therapy, with much of the literature relying on anecdotal reports. Kaplan, Edelson & Seip (1998) investigated the use of prism lenses for children with ASC and found that although measures of visual performance did not improve, behavioural measures did, which again suggests that factors outside of the lenses were responsible for changes in behaviour.
In terms of feasibility, many visual therapies, such as Irlen lenses and coloured overlays, tend not to rely on complex and expensive equipment and have therefore been proposed as feasible to use within an educational setting (Ludlow, Wilkins & Heaton, 2006).

2.3.5.3.1.6 Multisensory Environments (MSEs)

Multi-Sensory Environments (MSEs) were pioneered in the late 1980’s for adults with profound and multiple learning difficulties (PMLD) in the Netherlands by Hulsegge and Verheul (1987). The term ‘snoezelen’ was used to describe these environments in order to convey the key principles of relaxation and stimulation. ‘Snoezelen’ has since become a registered trademark of one particular company marketing MSEs (de Bunsen, 1994), however the term is often used interchangeably with the general term ‘multi sensory environment’ (Mount & Cavet, 1995). Following Hulsegge and Verheul’s (1987) use of MSEs for adults with PMLD, a number of MSEs were also established for children in educational settings, particularly schools in the United Kingdom (UK) (Bozic, 1997), Australia (Stephenson, 2002) and North America (Botts et al., 2008).

MSEs in educational settings range in size, cost and variety of equipment, but typically include a suite of rooms, single room or designated area within a larger space housing a collection of sensory resources such as ball pools, projectors, bubble tubes, fibre optic lights, electronic devices to transmit sounds/music and aroma scents (Mount & Cavet, 1995). Settings with a limited budget may also utilise resources that are cheaper or homemade, such as foil, mirrors, and various textured materials (Stephenson, 2002).

MSEs provide an opportunity for passive leisure, generic sensory stimulation and teaching of specific skills (such as communication) for children with sensory needs in educational settings (Carter & Stephenson, 2012). Traditionally, MSEs were created solely to provide
opportunities for leisure within residential settings, however over the past years have increasingly been used in educational settings to deliver educational and therapeutic interventions (Hirstwood & Smith, 1996; Pagliano, 1998). These differing functions of MSEs have been debated in the literature, however Stephenson (2002) reports that ‘a middle ground is emerging where the use of the multisensory room is linked to the perceived individual needs of the student, and this may be for leisure (active or passive), therapy or education or all three’ (pp. 76).

Many British special educational settings have now invested in creating purpose-built MSEs, and guidance on the use of MSEs in educational settings has been put forward by a number of researchers (Hirstwood & Smith, 1996; Melberg & Jansson, 1994; Gallaher & Balson, 1994). The function of MSEs in educational settings has therefore become increasingly centred on supporting learning, as well as sensory, needs, with Gallager and Balson (1994) reporting the use of MSEs ‘to enhance our sensory work and also to aid development in other curriculum areas’ (pp. 136).

However, the use of MSEs as an intervention for supporting the sensory needs of children with ASC within educational settings has attracted criticism. Only a handful of research studies investigating the efficacy of MSEs have been conducted (Hogg, Cavet, Lambe & Smeddle, 2001; Lai, 2003; Lancioni, Cuvo & O’Reilly, 2002; Lotan & Gold, 2009) and even fewer on the use of MSEs specifically with children with ASC (Botts, Hershfeldt, & Christensen-Sandfort, 2008). In a review of the use of MSEs in educational settings, Carter and Stephenson (2012) concluded that the methodological quality of past research studies has been poor, research outcomes have been inconsistent and limited evidence of generalisation outside of the MSE has been demonstrated. The researchers therefore conclude that ‘available data do not allow conclusions to be drawn about the efficacy of MSEs and the intervention certainly does not meet the standards for an evidence-based practice’ (Carter & Stephenson, 2012 pp. 96).
2.3.5.3.2 Interventions promoting environmental change

A number of specific task and environmental modifications have also been described in the literature as a way of supporting unusual sensory responses in children with ASC in the classroom (Baranek, 2002; Bogdashina, 2003; Gilman, 2005). These interventions differ to the therapies discussed above as they take an environmental as opposed to within-child approach and therefore work to accommodate, rather than remediate, the unusual sensory responses experienced by children with ASC in the classroom. Baranek (2002) puts forward that environmental adaptations in the classroom can take the form of ‘changing performance expectations, modifying classroom activities to minimise negative sensory reactions, perceptual distortions or motoric difficulties, teaching compensatory strategies, and/or maximising the child’s strengths to bypass sensory and motor difficulties and facilitate fuller participation’ (pp. 418).

A number of environmental and task adaptations to support the sensory needs of children with ASC in educational settings have also been put forward by Bogdashina (2003). These include always preparing the child for changes in their sensory environment, gradually desensitising the child to distressing sensory stimuli, providing aids to help the child cope with distressing stimuli (for example ear defenders), reducing the level of ‘sensory pollution’ in the classroom, having clear action plans to help calm the child after a distressing experience (e.g. pleasant stimuli easily to hand), and having a quiet place available for the child to escape to in the event of sensory overload. Bogdashina (2003) argues that a detailed assessment of the child’s sensory needs should take place prior to environmental modifications being made to ensure that they are appropriately tailored to the child, for example using the Sensory Profile Checklist Revised (SPCR).

Gilman (2005) also discusses modifying the environment as an intervention for managing unusual sensory responses in children with ASC in educational settings. These environmental modifications are discussed in terms of
altering the activity, changing the location or setup of the environment in which the activity occurs and reorganising the sequence or timings of the activity (Gilman, 2005). Firstly, altering the activity is an environmental modification which involves educators thinking carefully about what the actual objective of the learning activity is and then making adaptations to the way in which a student goes about achieving this objective. A simple example of such would be a student using a pen rather than a pencil during a writing task to reduce the vibration and noise created by the pencil that the student finds difficult to tolerate (Gilman, 2005). Secondly, Gilman (2005) proposes that educators can also change the location or set up of the environment in which the activity occurs. For a student averse to fluorescent lighting and tactile defensive this might involve changing the position of the student’s desk so that it is nearer natural light and away from areas of high footfall. Lastly, reorganising the sequence or timings of activities is put forward as a potential strategy for modifying students’ learning environments. For example, this might involve a high school student with tactile defensiveness leaving lessons a couple of minutes early to avoid overcrowded corridors (Gilman, 2005).

Linked with Gilman’s (2005) proposal that educators should change the location or set up of the environment in which learning activities occur, Robertson (2012) described the development of a ‘Sensory Audit’, which is a set of protocols that form a toolkit to help objectively assess an environment for its ‘sensory suitability’ (pp. 180) for individuals with ASC. It is argued that recommendations for the amelioration of the environment can then be made based on the findings of the audit, which can aid accessibility for those with ASC. Robertson (2012) gives the example of an individual with ASC leaving their workplace at a certain time each week following the discovery from the sensory audit that the testing of the fire alarm in this period of time is a source of sensory distress for the individual. However, Robertson (2012) cautions that the ‘Sensory Audit’ has, as of yet, only been piloted with adults with ASC and in occupational settings. Therefore, the utility of such a tool within educational settings has not been researched. Robertson (2012) proposes that further research is needed to develop the audit and investigate
its use within a range of settings, for example schools and residential settings.

Interventions to support the sensory needs of children with ASC in the classroom have also taken the form of psycho-educational programmes. These programmes aim to increase children’s awareness of their sensory needs and teach coping strategies so that they may independently start to manage their unusual sensory responses within the classroom (Gilman, 2005). Children with ASC are therefore empowered to actively manage their own needs, rather than rely on the adults around them, promoting greater metacognition and independence in learning. One such programme is the ‘Alert Program’ by Williams and Shellenberger (1996), which aims to increase children’s cognitive understanding of their sensory needs and improve their ability to communicate what is happening inside their bodies. There have also been a number of workbooks published for educators and parents to use alongside children with unusual sensory responses (Auer & Auer, 2010; Kerstein, 2008) and individual storybooks about characters who experience unusual sensory responses (Veenendall, 2008), aimed at raising children’s awareness of their sensory needs and teaching coping strategies. It is argued that with a better cognitive understanding of their individual sensory needs, children with ASC, in particular those who are high functioning, can independently express what environmental changes need to be made. This is supported by Gilman (2005) who puts forward that educating people with ASC about their sensory needs ‘can facilitate independent change in the person...adaptation can then occur in natural contexts to improve function and ultimately increase the person’s sense of self-confidence self-control’ (Gilman, 2005, pp. 213).

The efficacy of making environmental changes for supporting the sensory needs of children with ASC within educational settings has received less attention within the literature compared to within-child interventions. Baranek (2002) states that ‘specific task/environmental modifications for sensory processing or motoric deficits tend to be described within the context of broader educational approaches or in combination with specific interventions
more so than they are reported in the empirical literature’ (pp. 418). There has, however, been some attention in the literature given to the ‘Alert Program’ by Williams and Shellenberger (1996), which has been linked with improvements in the self regulation of children with emotional disturbances (Barnes, Vogel, Beck, Schoenfeld & Owen, 2008) and fetal alcohol syndrome disorders (FASD) (Bertrand, 2009). The present author’s review of the literature, however, highlighted only one study investigating the use of the ‘Alert Program’ specifically with children with ASC (Bowen, Cloutier & Nichols, 2011). This research focused on investigating the perceptions of practitioners carrying out the intervention and reported themes regarding the self advocacy that the programme afforded to both the children and adults involved, the ease of use within multiple environments, the ability to adapt the programme to meet individual needs and the usefulness of the programme for providing a common language to discuss sensory experiences. However, no empirical investigations regarding the programme’s efficacy with children with ASC have been reported within the literature.

There has been considerably less discussion in the literature regarding the feasibility of making changes in the environment within educational settings when compared with research on within–child interventions. The present author proposes that these interventions are likely to be more feasible for supporting the sensory needs of children with ASC within educational settings, as they are more inclusive, do not require specialised equipment or knowledge and can be easily used alongside comprehensive educational programmes. This view is supported by Baranek (2002) who states that ‘such adaptations for sensory processing...would be feasible in many educational programs and could be used in tandem with other interventions’ (pp. 418). However, it is evident that targeted research is needed in order to fully investigate the feasibility of using such interventions in educational settings.
2.3.5.3.3 The role of professionals

Baranek (2002) suggests that ‘comprehensive educational programs may benefit from consultation with knowledgeable professionals (e.g. Occupational Therapists, Speech and Language Therapists, Physical therapists, Adaptive Physical Educators, etc.) to provide guidance about potential interventions for children whose sensory processing or motoric difficulties interfere with educational performance’ (pp. 418). The present author’s literature review highlighted a small number of papers which explored the role of the external professional in supporting children with ASC within educational settings in general. However, the majority of this research utilised survey and questionnaire methodology to elicit professionals’ experiences (Brown & Paterson, 2013; Watling, Deitz, Kanny & McLaughlin, 1999), rather than qualitative methodology. Furthermore, no papers were found which specifically investigated the role of external professionals in supporting the sensory needs of children with ASC within educational settings.

Therefore, at present, the nature of external support for children with ASC and sensory needs within educational settings is unclear. For example, do these professionals play a role in the assessment of unusual sensory responses within a school context? Are they responsible for directly delivering interventions in school or do they take more of a consultant role in intervention within educational settings? The present author argues that it is important for the role of the external professional to be investigated in order to aid multiagency working, determine how this role can be developed to ensure the best outcomes for children with ASC and shed light on the differences and similarities in role between professionals from different disciplines. In particular, it is argued that due to the lack of previous research, this investigation should take an exploratory approach using qualitative methodology to investigate external professionals’ views of their role in supporting the sensory needs of children with ASC within educational settings.
2.3.6 Summary of literature

The literature review aimed to answer a number of key research questions. This section will now take these questions in turn and provide a brief summary of the relevant literature.

2.3.6.1 Review question 1

*How are unusual sensory responses defined in the literature? What evidence is there of children with ASC experiencing unusual sensory responses?*

There are a number of conceptual models that have been put forward to explain the phenomena of unusual responses to sensory stimuli and therefore a number of descriptive terms have arisen within the literature. Dunn (1997) put forward a model based on the concept of ‘sensory processing’, which proposes that unusual sensory responses result from the interaction between an individual’s neurological threshold for stimulation and their behavioural response. It is posited that these interactions result in four patterns of sensory processing: poor registration, sensation seeking, sensitivity, and sensation avoiding. Ayres (1972) put forward the theory of ‘sensory integration’ and proposed that unusual responses to sensory stimuli result from an impairment in an individual’s ability to organise and assimilate sensory information. Miller et al. (2007) later expanded on this theory by proposing a detailed model of classification for numerous sensory patterns, such as Sensory Modulation Disorder (SMD), Sensory Based Motor Disorder (SBMD), and Sensory Discrimination Disorder (SDD). A number of descriptions of unusual sensory responses have also been put forward specifically for individuals with ASC. Delacato (1974) proposed a number of distinct sensory patterns in individuals with ASC, which were termed ‘hypersensitivity’, ‘hyposensitivity’ or ‘white noise’. Alternatively, Bogdashina (2003) and Baranek et al. (2014) present much broader conceptualisations of unusual sensory responses. These differing classification systems and conceptualisations of unusual sensory responses have therefore led to difficulties in operationally defining this
phenomenon in individuals with ASC (Koziol et al., 2011). The present author argues that the evidence base is, at present, conceptually unclear, with complex interactions being presented without clear proposals as to the links between processes at the biological, cognitive and behavioural level. It is therefore proposed that there is a need for more exploratory research, which investigates the unusual sensory responses of children with ASC using open ended questions as opposed to relying on materials based on pre-conceived conceptualisations.

A number of studies providing evidence of unusual sensory responses in individuals with ASC have been reported in the literature. Studies utilising behavioural checklists have found a higher prevalence of unusual sensory responses in children with ASC when compared to typically developing children (Baranek et al., 2006; Ben-Sasson et al., 2009; Dunn et al., 2002; Kern et al., 2006; Kientz & Dunn, 1997; Rogers et al., 2003; Talay-Ongan & Wood, 2000; Tomchek & Dunn, 2007; Watling et al., 2001). Neurobiological studies of unusual sensory responses have also provided evidence of children with ASC experiencing difficulties with the integration and modulation of sensory input (Hazan et al., 2014). A number of studies employing psychophysiological methodologies have also found evidence of unusual responses to sensory stimuli within the domains of vision (Ashwin et al., 2009; Bertone et al., 2003; Simmons et al., 2009), hearing (Bonnel et al., 2003; Heaton et al., 2008; Jarvinen-Pasley et al., 2002; Mottron et al., 1999; O’Riordan & Passetti, 2006), touch (Blakemore et al., 2006; Cascio et al., 2008; Tommerdahl et al., 2006), and olfaction (Ashwin et al., submitted; Bennetto et al., 2007; Boyd et al., 2010; Suzuki et al., 2003; Tavassoli et al., submitted). This empirical evidence base is supplemented by numerous self reports (Ashburner et al., 2013; Kirby et al., 2014; Robertson, 2012; Walker and Cantello, 1994) and personal accounts written by individuals with ASC (Grandin, 1988, 1992, 2009; Grandin & Scariano, 1986; Jackson, 2002; Williams, 1996, 1998; Jones et al., 2003) that describe a range of unusual responses to sensory stimuli.
2.3.6.2 Review question 2

*What impact do unusual sensory responses have on children with ASC within an educational setting?*

There have been a small number of studies investigating the impact of unusual sensory responses in children with ASC in the classroom. Unusual sensory responses in children with ASC have been found to be associated with behavioural and emotional problems (Baker et al., 2008) and heightened anxiety (Pfeiffer et al., 2005), which are argued to in turn impact negatively on academic achievement (Eaves & Ho, 1997). Furthermore, Ashburner et al. (2008) found that auditory filtering difficulties, sensory underresponsiveness and sensory seeking were associated with academic underachievement. However, these research findings should be taken with caution due to their correlational nature and the lack of control for other factors which may have also been associated with academic underachievement.

2.3.6.3 Review question 3

*How are unusual sensory responses in children with ASC supported within an educational setting? What are the barriers and facilitators of such support?*

The review of literature highlighted a number of interventions for supporting children with ASC experiencing unusual sensory responses in educational settings. Interventions aimed at remediating the unusual sensory responses of children with ASC, include SIT, sensory integration-based interventions, sensory stimulation techniques, AIT, visual therapies and MSEs. Interventions aimed at accommodating the unusual sensory responses of children with ASC, include specific task and environmental modifications and psycho-educational programmes aimed at raising children’s awareness of their sensory needs and teaching coping strategies.

The efficacy of interventions, particularly interventions aimed at promoting within-child change, for supporting the sensory needs of children with ASC has
been debated within the literature. Much of this debate has centred on the use of SIT, with a recent systematic review concluding that ‘the current evidence-base does not support the use of SIT in the education and treatment of children with autism spectrum disorders’ (Lang et al., 2012, pp. 1004). Similar issues regarding the efficacy of sensory integration-based and sensory stimulation interventions have been raised (Baranek, 2002). The efficacy of therapies unrelated to theories of sensory integration have also been called into question, such as AIT and visual therapies (Baranek, 2002). Furthermore, the use of MSEs as an intervention for supporting the sensory needs of children with ASC within educational settings has also attracted criticism with a recent review concluding that ‘available data do not allow conclusions to be drawn about the efficacy of MSEs and the intervention certainly does not meet the standards for an evidence-based practice’ (Carter & Stephenson, 2012 pp. 96). The efficacy of making environmental changes for supporting the sensory needs of children with ASC within educational settings has received considerably less attention within the literature. There has been some empirical investigation of the efficacy of the ‘Alert Program’ by Williams and Shellenberger (1996), however not with children with ASC.

The feasibility of implementing such interventions within an educational setting has been called into question (Baranek, 2002). Issues of feasibility have been particularly highlighted with regards to therapeutic interventions, such as SIT and AIT, due to the highly specialised and expensive equipment required (Baranek, 2002). However, there has been considerably less discussion in the literature regarding the feasibility of interventions based on making environmental changes within educational settings. It is also evident that although there has been some consideration of the barriers to supporting the sensory needs of children with ASC in the classroom, there has been less consideration of the facilitators of such interventions. Therefore, the present author argues that further research is needed in order to add to the literature base regarding interventions to support the sensory needs of children with ASC within educational settings and the barrier and facilitators to such interventions.
2.4 Rationale for the present research

2.4.1 Identification of the ‘knowledge gap’

It is clear from the literature that many individuals with ASC experience unusual responses to sensory stimuli, however the literature review highlighted a lack of consensus surrounding the conceptualisation of the phenomenon termed in this thesis as ‘unusual responses to sensory stimuli’. The present author also identified that the majority of research into unusual sensory responses in children with ASC has been limited to clinic and research based settings. Brown and Dunn’s (2010) research findings suggest that unusual sensory responses in children with ASC may be influenced by contextual characteristics, meaning that different sensory responses may be observed at school and home. There have been a small number of studies investigating the unusual sensory responses of children with ASC within an educational setting (Ashburner et al., 2008; Baker et al., 2008; Pfeiffer et al., 2005), however these studies have relied on materials using closed questions and based on predetermined conceptualisations of unusual sensory responses. It is argued that there is a need for more exploratory research into the unusual sensory responses experienced by children with ASC within educational settings, beginning with a consideration of the unusual sensory responses of children with ASC from the perspective of those who have experience of providing consultation, advice and support for such responses within an educational context. Furthermore, O’Neill and Jones (1997) posit that ‘it is only by applying the range of scientific methodologies available that we will come to a full understanding of the significance of these sensory-perceptual phenomena’ (pp. 291). Therefore, it is argued that there is the need for an exploratory investigation, using qualitative methodology, into professionals’ experiences of the unusual sensory responses demonstrated by children with ASC within educational settings.

The present author’s literature review also highlighted a lack of research exploring how the unusual sensory responses of children with ASC are supported specifically within educational settings. As detailed above, there has been some discussion in the literature regarding interventions for use at a school level.
(Baranek, 2002; Bogdashina, 2003), however it is argued that at present this area of research is still in its infancy. Furthermore, the present author identified a lack of literature exploring the role that external professionals play in supporting the sensory needs of children with ASC within educational settings, in particular the EP. It is therefore argued that there is a need to investigate how the unusual sensory responses of children with ASC are being supported within educational settings, at both a within-school and professional level.

In summary, on reflection of the literature the present author identified the following gaps in research:

1. A lack of research investigating professionals’ experiences of unusual sensory responses in children with ASC within an educational setting.
2. A lack of research utilising qualitative methodologies to investigate unusual sensory responses in children with ASC in educational settings.
3. A lack of research exploring how unusual sensory responses in children with ASC are supported within educational settings and the barriers and facilitators to such support.

Therefore, the present researcher identified an opportunity for a research project to gather and qualitatively analyse professionals’ experiences with regards to unusual sensory responses demonstrated by children with ASC in educational settings and how these needs are supported.

2.4.2 Research Questions

The present research has three Research Questions (RQs):

1. What experiences and conceptualisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?
2. What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?

3. What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?

2.4.3 Expected contribution to knowledge and utility of the present research

The present author puts forward that there will be an original contribution to knowledge following the gathering of data to answer these research questions. Firstly, as discussed in the literature review, there is a lack of conceptual clarity regarding the nature of unusual sensory responses experienced by children with ASC. It is argued that research question one in the present investigation will support a broader and richer conceptual understanding of this construct to be captured. Secondly, the present investigation will add to the emerging literature exploring how the sensory needs of children with ASC can be supported in educational settings. Specifically, research question two will investigate how sensory needs are supported whilst research question three will investigate the barriers and facilitators to such support.
Chapter 3

Methodology

3.1 Overview of chapter

The rationale for the present study was prompted by the lack of empirical and conceptual consensus within the literature regarding the unusual sensory responses of children with ASC. In particular, the present author identified a lack of research exploring how these unusual responses are conceptualised and experienced by professionals in an educational context. Therefore, the need for an exploratory research project investigating professionals’ experiences of unusual sensory responses of children with ASC within an educational setting was identified. This chapter outlines the methodology used to investigate those experiences in order to address the following research questions:

1. What experiences and conceptualisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?

2. What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?

3. What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?

This chapter provides a comprehensive description of the methodology. Firstly, the ontological, epistemological and axiological position of the research design is outlined. Secondly, the research design is described in detail with reference to the study design, sampling and participant recruitment, data gathering methods and data analysis methods. Following this, the reliability and trustworthiness, ethical
considerations, operational risks and timeline of the research will be presented. Within each of these sections, the present author will provide an explanation and justification for the methodological decisions made. The chapter will then conclude with a critique of the methodology, including a critical discussion of the research design, data collection method and data analysis process.

3.2 Ontological position

Ontology is the philosophy of the world view of reality (Heron & Reason, 1997). Burrell and Morgan (1979) discuss the ontological assumptions that underpin the different conceptions of the social world held by researchers. This has been summarised as the positivist-relativist debate, referring to whether social reality is believed to be external to the individual and objective in nature or a product of individual consciousness and therefore a result of individual cognition (Cohen, Manion & Morrison, 2011). Cohen et al. (2011) argue that ‘fitness for purpose’ must be the guiding principle when conducting research and therefore posit that there will be different ontological positions adopted for different research purposes. Furthermore, Hitchcock and Hughes (1995) put forward that a researcher’s ontological position gives rise to their epistemological assumptions, in turn affecting their methodological decisions regarding research design and methods of data collection and analysis. Therefore, it is argued that researchers should be clear about their ontological position from the outset of their research (Cohen et al., 2011).

The present researcher adopted a critical realist ontological position as this is argued to provide a particularly suitable framework for conducting real world research (Singleton, Straits & Straits, 1993). Critical realism was first put forward by Roy Bhaskar in 1975 following attempts to encompass the polarised ontological assumptions of positivism and relativism into one position when conducting social science research (Bhaskar & Norrie, 1998). This development came about following critiques of both positivism and relativism being too reductionist; the former over emphasising the assumption that what we observe is all that exists and the latter placing too much importance on how the world is experienced and perceived (Danermark, Erkstrom, Jakobson & Karlsson, 2002). Critical realism rejects a purely positivist or relativist scientific approach and instead proposes that reality exists
regardless of what we think about it, while also acknowledging that the knowledge acquired about this external world is fallible (Robson, 2002). For this reason, critical realists are critical of their ability to know reality with absolute conviction (Research Methods Knowledge Base, 2012). Patomaki and White (2000) put forward that critical realism:

"can be said to be committed to ontological realism (that there is a reality, which is differentiated, structured and layered, and independent of mind), epistemological relativism (that all beliefs are socially produced and hence potentially fallible), and judgemental rationalism (that despite epistemological relativism, it is still possible in principle, to provide justifiable grounds for preferring one theory over another)." (pp. 224)

A critical realist ontological position was adopted in the present research as it was identified that by interviewing professionals about their experiences of unusual sensory responses of children with ASC, a number of ‘units of knowledge’ would emerge, but that these would be influenced by the characteristics, perceptions and approaches of the present author and professionals themselves (Singleton et al., 1993).

3.3 Epistemological position

Epistemology concerns how the knowledge about reality is understood (Robson, 2002). Sayer (1992) proposes that within a critical realist standpoint, a researcher’s theory of ‘being’ (ontology) precedes their theory of knowledge about that ‘being’ (epistemology), meaning that their ontological and epistemological positions are shared (Bergin, Wells & Owen, 2008). Therefore, a critical realist epistemological position was adopted, denoting the present author’s view that the knowledge gained in the present study represents the reality for professionals working with children with ASC experiencing unusual sensory responses, while recognising the fallibility of this knowledge due to the researcher’s and participants’ perceptions of reality. The present author considered this approach to be as justly scientific as a purely positivist approach, which would have disregarded the fallibility of knowledge acquired (Banister, Burman, Parker, Taylor, & Tindall, 1999).
The present research aimed to gain knowledge about the unusual sensory responses of children with ASC and how these are supported within an educational context, therefore addressing the gaps in the literature identified in Chapter 2. As a critical realist, the present author considered reality to exist independently of thinking, however was critical of their ability to know reality with certainty. This critical realist view of science thus influenced the methodology adopted for acquiring knowledge in the present study. Firstly, the present study aimed to gain knowledge by means of interaction with other people, due to the belief that the production of knowledge is a social activity (Sayer, 1992). Therefore, the present study took an exploratory form by gathering the perceptions and experiences of key professionals through the use of semi structured interviews as part of a single embedded case study design. Secondly, as already stated, the critical realist position suggests that knowledge is fallible (Sayer, 1992). Therefore, the present study used triangulation through multiple interviews with different professionals in order to gain a broader understanding of the unusual sensory responses experienced by children with ASC within an educational context.

3.4 Axiological considerations

Axiology concerns the role of values (Robson, 2002). Jenner (2004, pp. 97) states that:

‘No person is a vacuum, going into a research situation with no cognitive models, views of the world, or a mediation of the meanings by the use of language. We all have schemata and frameworks to model the world around us’.

Therefore, the present author acknowledged that the research topic choice and how the research was approached, interpreted and reported were influenced by their own values and beliefs. Banister et al. (1999) argue that the values adopted by the researcher in their study should be clearly specified within the research process and reporting, therefore the present author will now detail the values and beliefs that were present in the current study.
Firstly, a guiding principle which influenced the present author’s thinking throughout the research was the view that gaining a broader understanding of the sensory needs of children with ASC, and how these needs are supported, would contribute to better outcomes for these children. This linked with the high value placed on the experiences of EPs, Specialist Teachers and OTs by the present author with regards to better understanding and supporting the unusual sensory responses of children with ASC.

Secondly, the present author adopted a strengths-based view, for example using the terms Autistic Spectrum Condition (ASC), as opposed to Autistic Spectrum Disorder (ASD), and ‘unusual sensory responses’, as opposed to ‘sensory problems/difficulties/disorder’. This stemmed from the present author’s objection to the medicalisation of the experiences of individuals with ASC and preference for viewing these as merely different rather than abnormal (Baron-Cohen et al., 2009; Bogdashina, 2003). This value also links with the present author’s position as a critical realist. The present author believes there to be particular ways that children with ASC respond to sensory input (an objective social reality), however construes these responses as ‘unusual’ as opposed to a deficit or disorder; a social construction which could have influenced the conduct and analysis of interviews (Runswick-Cole, 2011).

Lastly, the present author subscribes to the view that real world research can be valuable for developing evidence based practice (Robson, 2002). Many researchers have discussed the pragmatic issues of translating evidence base into practice (DCSF, 2008), particularly with regards to the complexities of implementation within real world settings (Durlak & Dupre, 2008). These difficulties are further confounded when the evidence base for a particular topic is unclear, as is the case for unusual sensory responses in children with ASC. Therefore, the present author placed great importance on seeking the views of those professionals involved in supporting children with ASC experiencing unusual sensory responses with regards to the translation of evidence base into practice.
3.5 Research design

3.5.1 Case study design

3.5.1.1 Rationale for using a case study design

Yin (2009) stated that when deciding on a research strategy, researchers need to consider three conditions: ‘(a) the type of research question posed, (b) the extent of control an investigator has over actual behavioural events and (c) the degree of focus on contemporary as opposed to historical events’ (pp. 8). It is argued that these conditions facilitate the selection of the most appropriate research design for a given research project (see Figure 3.1).

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<th>METHOD</th>
<th>Form of Research Question</th>
<th>Requires Control of Behavioral Events?</th>
<th>Focuses on Contemporary Events?</th>
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<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Survey</td>
<td>who, what, where, how many, how much?</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Archival Analysis</td>
<td>who, what, where, how many, how much?</td>
<td>no</td>
<td>yes/no</td>
</tr>
<tr>
<td>History</td>
<td>how, why?</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Case Study</td>
<td>how, why?</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

Figure 3.1. Relevant situations for different research methods (taken from Yin, 2009, pp. 8).

Yin (2009) stated that ‘the first and most important condition for differentiating among the various research methods is to classify the type of research question being asked’ (pp. 10). The present study’s research questions took the form of ‘what’ questions. However, Yin (2009) put forward that ‘what’ questions can be either exploratory or quantitative in nature. Exploratory ‘what’ questions
are linked with studies aiming to develop relevant hypotheses about a particular phenomenon or highlight further lines of enquiry. Quantitative ‘what’ questions are linked with studies investigating aspects of prevalence regarding a particular phenomenon. The present study’s research questions took the form of exploratory ‘what’ questions, aiming to qualitatively explore practitioners’ experiences, conceptualisations and pragmatic issues in supporting unusual sensory responses in children with ASC within educational settings. Yin (2009) argued that such research questions are congruent with a case study design, however there are a number of other research designs which are congruent with investigating exploratory ‘what’ questions. Therefore, the extent of control the present researcher had over actual behavioural events and the degree of focus on contemporary events were also considered in order to identify the most appropriate research design. In the present study the researcher did not have control over the experiences of practitioners with regards to unusual sensory responses in children with ASC in educational settings. In addition, the research aimed to investigate these experiences within a contemporary real life context.

Therefore, taking these conditions into account, it is argued that a case study design was the most appropriate research design for the present study. This is supported by Yin’s (2009) assertion that ‘a case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence’ (pp. 3). Furthermore, Lofland and Lofland (1984) put forward that the aim of qualitative research is to ‘collect the richest possible data’ (pp.11). In the present study the researcher conceptualised ‘rich data’ as the collection of varied information, from multiple perspectives, which is relevant to the research questions posed (Lofland & Lofland, 1984; Miles & Huberman, 1994; Richards, 1999). Yin (2009) posited that case studies can provide such ‘rich data’ as they offer insights from a range of perspective and experiences within a particular context.
3.5.1.2 Case definition

Yin (2003) proposed that a ‘a case study is used in many situations to contribute to our knowledge of individual, group, organisational, social, political, and related phenomena’ (pp. 1). Therefore, there are a number of different types of case study that can be utilised. Yin (2009) described three types of case studies: explanatory, descriptive and exploratory. Explanatory case studies are used when the study’s research questions are of a ‘how’ or ‘why’ nature and therefore are aimed at explaining a given phenomenon within a particular context. Descriptive case studies are used to develop descriptive theories regarding the phenomenon being studied. Exploratory case studies are used when the existing knowledge base of the phenomenon being studied is poor and/or when there is a lack of noteworthy conceptual frameworks. As discussed in Chapter 2, a number of studies have reported that many children with ASC experience unusual responses to sensory stimuli, however currently there is a lack of conceptual consensus regarding the causes and appropriate support for these responses within an educational context. Therefore, an exploratory case study was identified as the most appropriate type of case study design for the present study.

Furthermore, Yin (2009) stated that a case study may be further classified in terms of the number of cases being studied and number of units of analysis within the study, creating a 2 x 2 matrix (See Figure 3.2).

<table>
<thead>
<tr>
<th></th>
<th>Single case</th>
<th>Multiple cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single unit of</td>
<td>Single-holistic</td>
<td>Multiple-holistic</td>
</tr>
<tr>
<td>analysis</td>
<td>case study</td>
<td>case study</td>
</tr>
<tr>
<td>Multiple units of</td>
<td>Single-embedded</td>
<td>Multiple-embedded</td>
</tr>
<tr>
<td>analysis</td>
<td>case study</td>
<td>case study</td>
</tr>
</tbody>
</table>

Figure 3.2. Case study classification matrix.
In the present research a single case was investigated, defined as the unusual sensory responses experienced by children with ASC within the context of professional support to educational settings. The decision about whether to use an embedded or holistic case study is argued to depend upon the research questions being posed; embedded if it involves more than one unit of analysis or holistic if it involves a single unit of analysis (Yin, 2009). Yin (2009) identified close links between a research question and unit of analysis. Therefore, the present study had three units of analysis (UoA), which explored professionals’ experiences of a) unusual sensory responses in children with ASC in educational settings b) how these responses are supported and c) the barriers and facilitators to supporting these responses. The present study therefore adopted an exploratory single-embedded case study design (Yin, 2009) (See Figure 3.3).

![Figure 3.3 Exploratory single-embedded case study design.](image)

Yin (2009) also put forward the importance of describing a case study’s propositions, meaning the hypotheses that the researcher is looking to test through data collection and analysis. However, it has also been proposed that the statement of propositions within a case study’s design is not required if the topic of study is the subject of exploration (Yin, 2009). Therefore, the researcher purposely omitted propositions within the present study.
3.5.2 Sampling and participant recruitment

Coolican (2009) outlined the differences between the sampling of participants in qualitative and quantitative research and argued that due to the reduced emphasis on finding a representative sample of a wider population, qualitative researchers often employ non-probability sampling strategies. This is supported by Cohen et al. (2011), who suggested that

‘the selectivity which is built into a non-probability sample derives from the researcher targeting a particular group, in the full knowledge that it does not represent the wider population; it simply represents itself. This is frequently the case in small-scale research...ethnographic research, action research or case study research’ (pp. 113).

The present research was small scale and qualitative in nature and therefore took a non-probability approach to sampling. More specifically, an opportunistic, also known as convenience, approach to sampling was taken so that the present researcher could choose the sample from practitioners to whom they had easy access. This decision is supported by Cohen et al’s (2011) assertion that ‘a convenience sample may be the sampling strategy selected for a case study or series of case studies’ (pp. 114). Therefore, in the present study, the researcher’s university and placement supervisors’ knowledge was used in order to opportunistically identify potential participants. All potential participants were contacted by phone or email to request their participation until the desired sample was achieved.

Cohen et al. (2011) posit that ‘in qualitative research it is more likely that the sample size will be small’ (pp. 102). In the present study, the researcher did not seek to generalise findings to a wider population due to the research being exploratory in nature. Therefore, the decision regarding the number of participants to be included in the study did not depend on creating a representative sample, but instead on having enough participants to gain sufficient data yet ensure that participant recruitment and data collection did not exceed the timescale and operational limitations of the study. Therefore, taking into account these factors,
the present researcher decided on a sample size of six participants. In addition, the present researcher identified that those practitioners who may be called upon to offer consultation, advice and intervention within educational settings regarding the sensory needs of children with ASC span a number of professions, namely specialist teaching, educational psychology and occupational psychology. Therefore, the sample was made up of two Specialist Teachers (specialists in ASC), two Educational Psychologists (specialists in ASC) and two Occupational Therapists (see Table 3.1).

<table>
<thead>
<tr>
<th>Participant Number</th>
<th>Professional role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1 (EP1)</td>
<td>Specialist Educational Psychologist (SEP)</td>
</tr>
<tr>
<td>Participant 2 (ST1)</td>
<td>Specialist Teacher (ST)</td>
</tr>
<tr>
<td>Participant 3 (OT1)</td>
<td>Occupational Therapist (OT)</td>
</tr>
<tr>
<td>Participant 4 (OT2)</td>
<td>Occupational Therapist (OT)</td>
</tr>
<tr>
<td>Participant 5 (ST2)</td>
<td>Specialist Teacher (ST)</td>
</tr>
<tr>
<td>Participant 6 (EP2)</td>
<td>Specialist Educational Psychologist (SEP)</td>
</tr>
</tbody>
</table>

Table 3.1. Participant information.

3.5.3 Data gathering methods

The research involved the present author conducting six semi structured interviews with professionals who were specialists in supporting children with ASC in educational settings and paediatric occupational therapists. Each professional was interviewed individually in order to explore in detail their experiences with regards to the unusual sensory responses demonstrated by children with ASC in educational settings, how these are supported and the barriers and facilitators to such support. The interview questions and probes (see Appendix A) were guided by literature that discusses unusual sensory responses in children with ASC and the present study’s research questions. The interview schedule used a standardised open-ended format, which although reduces the flexibility of the interviewer, increases the comparability of responses from different interviews (Cohen et al., 2011). The interview schedule was piloted before data collection
began to ensure timing and probes were appropriate. Following no concerns with
the research methodology and interview schedule this pilot was subsequently
included as part of the sample (Participant 1). Each interview was recorded using
an audio recorder and a typed transcription of the interview was produced, making
sure all names and places were anonymised.

3.5.4 Data analysis

3.5.4.1 Data analysis technique

Existing literature exploring the role of professionals in supporting the sensory
needs of children with ASC within educational settings is limited. This study
therefore took an exploratory approach across professionals rather than
seeking to compare and contrast the accounts of professionals from different
disciplines. Therefore, the data collected from the six interviews was
amalgamated into one data set. This data set was analysed using Braun and
Clarke’s (2006) six phase model of thematic analysis (see Table 3.2). This
allowed the researcher to identify, analyse and report themes within the data
(Braun and Clarke, 2006) that linked specifically to the present study’s research
questions. Braun and Clarke (2006) posited that thematic analysis is
compatible with a range of epistemological positions due to its theoretical
freedom, therefore making it a flexible research tool capable of facilitating a rich
and detailed analysis of data. The use of thematic analysis as a method of data
analysis in the present study was therefore judged to be appropriate in light of
the present author’s epistemological position of critical realism (Robson, 2002),
due to its description as ‘a method that works both to reflect reality and to
unpick or unravel the surface of ‘reality’’ (Braun and Clarke, 2006, pp.81).

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description of the process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Familiarising yourself with your data:</td>
<td>Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.</td>
</tr>
</tbody>
</table>
2. Generating initial codes: Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.

3. Searching for themes: Collating codes into potential themes, gathering all data relevant to each potential theme.

4. Reviewing themes: Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic ‘map’ of the analysis.

5. Defining and naming themes: Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.

6. Producing the report: The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Table 3.2. Phases of thematic analysis (taken from Braun and Clarke, 2006).

It is argued that researchers using qualitative analyses need to explicitly detail the process via which themes are identified (Attride-Stirling, 2001). Braun and Clarke (2006) put forward a ‘number of decisions’ (pp. 81) that researchers need to make prior to using thematic analysis and argue that ‘in practice, these questions should be considered before analysis (and sometimes even collection) of the data begins, and there needs to be an ongoing reflexive dialogue on the part of the researcher or researchers with regards to these issues, throughout the analytic process’ (pp. 82).

Firstly, researchers using thematic analysis need to decide what counts as a theme. Braun and Clarke (2006) suggest that prevalence is an important factor to consider when coding for themes in the data, meaning ideally there should be a number of occurrences of the theme across the data set. However, they also emphasise that this is not something that is or should be quantifiable.
Therefore, the present author used researcher judgement to decide what counted as a theme, remained flexible throughout the analysis and utilised subthemes to reflect decisions made regarding prevalence. Furthermore, the present researcher employed an inter-coder reliability measure at the stage of generating codes from the data, with the aim of enhancing the credibility of codes, and therefore themes, generated during thematic analysis (see section 3.6.2 for more detailed information).

Secondly, Braun and Clarke (2006) posit that researchers using thematic analysis need to decide whether to provide a rich description of the data set or a detailed account of one particular aspect. Although the present study aimed to answer specific research questions, it was also predominantly exploratory in nature. Therefore a rich description of the entire data set was provided, in line with Braun and Clarke’s (2006) view that ‘this might be a particularly useful method when you are investigating an under-researched area, or you are working with participants whose views on the topic are not known’ (pp. 83).

Thirdly, Braun and Clarke (2006) argue that researchers using thematic analysis need to decide whether to conduct an inductive and/or theoretical analysis. In the present study the present author used both an inductive and deductive approach to thematic analysis, therefore integrating data-driven codes with theory-driven codes. The majority of analysis was inductive, also known as ‘bottom up’, meaning that the process of coding did not try to fit the data into a pre-existing coding frame or be driven by analytic preconceptions. Some coding and theme development was influenced by Frederickson and Cline’s (2002) Interactive Factors Framework (IFF), in particular the theme development regarding participants’ conceptualisations of unusual sensory responses (see Section 4.2.1).

Lastly, Braun and Clarke (2006) argue that researchers using thematic analysis need to decide whether to code themes at a semantic and/or latent level. In the present study the present author used both a semantic and latent approach to coding and theme development. On the whole, data were analysed at a semantic level, meaning that on the majority of occasions coding and theme
development reflected the explicit content of the data. However, on occasions
certain concepts and assumptions underpinned data coding and theme
development. For example, the present author used their prior knowledge of
concepts within the literature to develop the basic subtheme of ‘hyper-hypo
continuum’ (see Section 4.2.1.2.2).

As advocated by Braun and Clarke (2006), the coded themes from the data set
were then used to generate hypotheses regarding the significance of the
themes and their broader implications in relation to the present study’s research
questions and previous literature in this area.

3.5.4.2 Data presentation

Cohen et al. (2011) discussed the differing levels of verbatim data that
researchers can include when presenting their data. The present researcher
chose to present a large number of direct quotations in order to retain the
flavour and richness of the original data. They also discussed the different
methods available to researchers for structuring their data presentation. The
present researcher chose to present data by research question in order to
facilitate coherence and help the reader keep in mind the questions
underpinning the research.

3.5.5 Summary of research design

A summary of the present study’s research design can be seen in Table 3.3,
which illustrates the explicit links between research questions, data gathering
method and data analysis method.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data gathering method</th>
<th>Data analysis method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What experiences and conceptionalisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?</td>
<td>Interview-Questions 1, 2, 3</td>
<td>Thematic analysis</td>
</tr>
<tr>
<td>2. What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?</td>
<td>Interview-Questions 4, 5</td>
<td>Thematic analysis</td>
</tr>
<tr>
<td>3. What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?</td>
<td>Interview-Questions 6, 7</td>
<td>Thematic analysis</td>
</tr>
</tbody>
</table>

Table 3.3. Research questions, data gathering methods and data analysis methods.

3.6 Reliability and validity

Yin (2009) discussed four tests that are commonly used to judge the quality of case study research: construct validity, internal validity, external validity and reliability (See Table 3.4). However, it has been argued that the term ‘validity’ does not map well onto qualitative research paradigms and therefore a number of researchers have sought to redefine validity in qualitative research using terms such as quality, rigour and trustworthiness (Davies & Dodd, 2002; Lincoln & Guba, 1985; Seale, 1999; Stenbacka, 2001). The concept of ‘trustworthiness’ (Lincoln & Guba, 1985) has been argued to enable researchers to demonstrate that their qualitative research
is “defensible” (Johnson, 1997, pp. 282) and consequently increase confidence in research findings. Therefore, the present researcher employed a number of strategies to enhance the reliability and trustworthiness of the research.

<table>
<thead>
<tr>
<th>Tests</th>
<th>Case study tactic</th>
<th>Phase of research in which tactic occurs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct validity</td>
<td>• Use multiple sources of evidence</td>
<td>Data collection</td>
</tr>
<tr>
<td></td>
<td>• Establish chain of evidence</td>
<td>Data collection</td>
</tr>
<tr>
<td></td>
<td>• Have key informants review draft case study report</td>
<td>Data collection</td>
</tr>
<tr>
<td>Internal validity</td>
<td>• Do pattern-matching</td>
<td>Data analysis</td>
</tr>
<tr>
<td></td>
<td>• Do explanation building</td>
<td>Data analysis</td>
</tr>
<tr>
<td></td>
<td>• Address rival explanations</td>
<td>Data analysis</td>
</tr>
<tr>
<td></td>
<td>• Use logic models</td>
<td>Data analysis</td>
</tr>
<tr>
<td>External validity</td>
<td>• Use theory in single-case studies</td>
<td>Research design</td>
</tr>
<tr>
<td></td>
<td>• Use replication logic in multiple-case studies</td>
<td>Research design</td>
</tr>
<tr>
<td>Reliability</td>
<td>• Use case study protocol</td>
<td>Data collection</td>
</tr>
<tr>
<td></td>
<td>• Develop case study database</td>
<td>Data collection</td>
</tr>
</tbody>
</table>

Table 3.4. Case study tactics for four design tests (taken from Yin, 2003, pp. 34).

3.6.1 Trustworthiness

There were a number of steps taken to enhance the trustworthiness of the present research based on the strategies outlined by Yin (2009) in Table 3.4. Multiple sources of information were used to triangulate data by interviewing two practitioners from three different professions in order to gain a range of perspectives and experiences with regards to the sensory needs of children with ASC in educational settings. In order to gain a rich and honest account of their experiences in this area, the present author established positive relationships with participants, employed consultation skills in order to help them feel at ease,
provided them with clear information about the aims of the research and emphasised their anonymity throughout the research. The contact details of the present author were left with participants and they were encouraged to contact the researcher should they wish to add any further comments to enhance the accuracy of their account. During the data analysis the present researcher ensured that there was sufficient evidence to support the themes that had been identified from the transcripts (see Appendix B). Furthermore, after the themes had been identified, the present researcher read back through all of the interviews in order to ensure that the identified themes provided an accurate reflection of the data set. The present researcher also maintained a clear chain of evidence in order to make the derivation of conclusions transparent to the reader (Yin, 2009) (see Appendix C).

Yin (2009) argues that although case study designs do not afford statistical generalisability, they do afford analytic generalisability, meaning that they can assist in generalising or applying a particular set of results to a broader theory, which can be used as the foundation for replication studies. Therefore, as put forward by Yin (2009) in Table 3.4, the researcher used previously developed theory as a template with which to compare the findings of the present research and therefore enhance analytic generalisability.

3.6.2 Reliability

Yin (2009) defined reliability as ‘demonstrating that the operations of a study – such as the data collection procedures – can be repeated, with the same results’ (pp. 34). There were a number of steps taken to minimise errors and biases in the present research, and therefore enhance the study’s reliability, based on the strategies outlined by Yin (2009) in Table 3.4. Robson (2002) discussed the factors that can make case study research more vulnerable to researcher bias, for example the subjective nature of data collection, analysis and reporting. Therefore, the present researcher made explicit the links between research questions, data gathering methods and data analysis (see Table 3.3) and documented the thematic analysis process (see Appendix C) in order to make explicit the decisions made with regards to data collection, analysis and reporting,
in turn increasing transparency for other researchers wishing to review or replicate the research. The present researcher employed measures to ensure the accuracy of data, such as producing full transcriptions in order to remain faithful to context and structure of participants’ utterances and re-listening to audio recordings in full alongside transcriptions to check for errors.

Furthermore, the present researcher employed an inter-coder reliability measure at the stage of generating codes from the data, with the aim of enhancing the credibility of codes, and therefore themes, generated during thematic analysis. Goodwin (2001) puts forward that such inter-coder validation allows for a measure of consistency between two judgements to be generated, which can enhance the trustworthiness of a researcher’s analysis. This process involved the present researcher providing a colleague, who was a newly qualified EP with experience of conducting thematic analysis at doctoral level, with four A4 pages of transcript from one of the interviews to code. The researcher’s and their colleague’s codes were studied (see Appendix D) and the present researcher reviewed the codes that had been generated with their colleague in order ensure codes had been grouped and interpreted correctly. Following this, the two lists were compared and the number of agreed codes noted. The present researcher identified eight codes in the segment of transcript and their colleague identified nine, totalling seventeen codes. There was agreement on sixteen of the codes and disagreement on one of the codes. This discrepancy occurred as a result of the practitioner colleague classifying ‘conflicting needs’ as a distinct code, whereas the present author included this within their pre existing code of ‘curriculum constraints’ (see Appendix D).

An inter coder reliability percentage of absolute agreement was calculated by dividing the number of times the researcher and their colleague agreed on the codes by the total number of codes present in the segment of transcript (16/17 x 100). Therefore, the percentage of absolute agreement was calculated as 94%. This level of agreement was judged to be high based on benchmarks of 75-90% absolute agreement that are suggested in published literature (Hartmann, 1977; Steimler, 2004). However, it has also been put forward that when calculating inter coder reliability, researchers need to take account of the amount of agreement
which would be expected by chance (Goodwin, 2001). Cohen’s kappa was therefore used as a measure of agreement to take into account chance by adjusting the observed level of absolute agreement (Cohen, 1960) (see Appendix E). The percentage of agreement taking into account the amount expected by chance was high (k= .89) using Graham, Milanowski and Miller’s (2012) benchmark for sufficient agreement.

3.7 Ethical considerations

The British Psychological Society’s (2009) ‘Code of Ethics and Conduct’ were followed by informing participants of the research objectives (see Appendix F), obtaining informed consent (see Appendix G), emphasising rights of withdrawal, avoiding deception, proper debriefing, maintaining confidentiality and protecting participants from harm. The researcher’s involvement throughout was with regard to British Psychological Society’s Professional Practice Guidelines (BPS, 2002) and the Health and Care Professionals Council (HCPC) Standards of Conduct, Performance and Ethics (HPC, 2008). Furthermore, notice was given to the appropriate National Health Service (NHS) Research and Development Office regarding the recruitment and interviewing of Occupational Therapists.

In order to fully understand, apply and promote research ethics the present author utilised planned and comprehensive supervision throughout the project from their university tutor and placement supervisor. Through this supervision, a number of ethical considerations specific to the present research project were identified and appropriate strategies planned to ensure complete ethical integrity. For example, Allmark et al. (2009) put forward that an ethical issue specific to conducting in-depth interviews is the matter of the dual role of a researcher. In the present research this dual role took the form of researcher and Trainee Educational Psychologist (TEP). Therefore, it was clearly communicated to all participants that the present author was acting in a researcher role as opposed to TEP role during interviews. It has also been proposed that a model of continuous or process consent be used when using in-depth interviews (Byrne, 2001; Nunkoosing, 2005; Richards & Schwartz, 2002). Therefore, the present author reaffirmed consent throughout the research process, for example seeking permission during the interview to delve a little deeper into
particular areas of professionals’ experiences. The present author also acknowledged that certain questions within the interview schedule could be misinterpreted by participants, such as interpreting the question asking about their knowledge of research as a judgment on their professional practice. Therefore, the present author clearly explained their reasoning for including this question in the interview schedule prior to asking it, which was to investigate participants’ views of whether the research literature maps onto their professional practice, and reassured participants that it was not a test of their knowledge.

The present research was assessed to present a low level of risk in accordance with the University of Manchester’s ethical guidelines. Ethical approval was granted on 19th June 2013. No modifications to the approved research plan were made. All documentation relevant to ethical approval can be found in Appendices H and I.

3.8 Operational risk analysis

<table>
<thead>
<tr>
<th>Risk</th>
<th>Level</th>
<th>Contingency Plan</th>
</tr>
</thead>
</table>
| Difficulty recruiting professionals to interview | Medium | • Ask university tutor and fieldwork supervisor to promote the research within their professional networks  
• Identify barriers to participation and try to problem solve these barriers |
| Professionals may not have time to do interview due to time constraints | Medium | • Be flexible as a researcher regarding dates and times for interviews  
• Arrange interviews well in advance so professionals can organise their work commitments accordingly |
| Professionals may withdraw from research  | Low   | • Make sure all participants have contact details for the researcher in order to talk through and address any worries, concerns or queries that arise during research  
• Be reliable as a researcher and keep to dates/actions agreed  
• Keep a list of other potential participants that can be contacted in the event of someone withdrawing |
Table 3.5. Operational risk analysis.

3.9 Research timeline

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Activity</th>
<th>Completed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Discuss research ideas with fieldwork supervisor and university tutor</td>
<td>26.11.12</td>
</tr>
<tr>
<td></td>
<td>Decide research idea with fieldwork supervisor</td>
<td>26.11.12</td>
</tr>
<tr>
<td></td>
<td>Conduct initial literature review</td>
<td>1.12.12</td>
</tr>
<tr>
<td></td>
<td>Complete draft thesis proposal and submit to university tutor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete participant information sheet and consent forms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Write interview schedule</td>
<td>4.1.13</td>
</tr>
<tr>
<td></td>
<td>Complete ethics form</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete and submit final thesis proposal</td>
<td>4.2.13</td>
</tr>
<tr>
<td></td>
<td>Complete and submit revised thesis proposal</td>
<td>21.3.13</td>
</tr>
<tr>
<td>Data Collection</td>
<td>Contact potential interview participants</td>
<td>19.7.13</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td>Arrange and conduct six interviews</td>
<td>18.2.14</td>
</tr>
<tr>
<td>Data analysis</td>
<td>Transcribe interviews</td>
<td>21.2.14</td>
</tr>
<tr>
<td></td>
<td>Thematic analysis of transcriptions</td>
<td>28.2.14</td>
</tr>
<tr>
<td>Write up</td>
<td>Literature review</td>
<td>25.10.13</td>
</tr>
<tr>
<td></td>
<td>Methodology</td>
<td>13.12.13</td>
</tr>
<tr>
<td></td>
<td>Findings</td>
<td>7.3.14</td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
<td>28.3.14</td>
</tr>
<tr>
<td></td>
<td>Final write up and submit to university</td>
<td>9.5.14</td>
</tr>
<tr>
<td>Feedback</td>
<td>Prepare brief written summary of research to send to participants</td>
<td>30.5.14</td>
</tr>
</tbody>
</table>

Table 3.6 Research timeline.

3.10 Critique of methods

The following section will critique the present study’s methodology with regards to the design of the study, method of data collection, and method of data analysis.

3.10.1 Design of the study

The present study adopted an exploratory single-embedded case study design (Yin, 2009). A number of limitations related to the use of a case study design have been put forward. Nisbet and Watt (1984) argued that the results generated from a case study may not be generalisable, are not easily open to cross checking with data from other research, and may be prone to researcher bias. However, as already discussed in section 3.6.1, Yin (2009) proposed that case study designs rely on analytic generalisability, meaning that they can assist in the interpretation of other similar situations or cases via shared theory. Case study designs have also been criticised due to a lack of methodological texts providing researchers with specific procedures to be followed, argued to result in a lack of rigour and substandard execution. However, the present author minimised this risk in the present study by utilising a comprehensive text of case study research by Yin.
(2009). Criticisms have also been made in relation to case studies being too time consuming, however these are usually made in relation to the use of ethnographic and participant-observation data collection methods (Yin, 2009) and therefore do not apply to the present research. Single case designs have been called into question for lacking breadth (Cohen et al., 2011; Robson, 2002; Sarantakos, 2005), however it has also been argued that single case designs afford researchers the opportunity to gain a deeper understanding of more complex cases within an exploratory framework (Yin, 2009).

Alternative designs for the study were explored, such as using a sequential mixed methods approach (Johnson & Onwuegbuzie, 2004). It is argued that the collection of both qualitative and quantitative data allows for a more comprehensive understanding of phenomena than single method approaches (Cohen et al., 2011). Therefore, the present author considered using a QUAN→QUAL mixed methods design (Johnson & Onwuegbuzie, 2004), meaning that a quantitative phase of data collection, a survey of relevant professionals, would be collected first in order to inform a subsequent qualitative phase of in depth interviews exploring the themes of the survey. By sending a survey to a number of Specialist Educational Psychologists, Specialist Teachers and Occupational Therapists, the present author could have reached a wider sample of participants. However, the underdeveloped knowledge base within this area, identified within the literature review, was not conducive to constructing a questionnaire and it was unlikely that a questionnaire could have provided the rich, qualitative information that the present author was seeking. The present author therefore concluded that a richer data set would be obtained through the use of a case study design rather than through a survey, or mixed methods design, as the focus of a case study design is on the quality and richness of data gathered rather than quantity.

3.10.2 Data collection method

The present study used a standardised open-ended interview format to gather data (see Appendix A). It is argued that interviews are a more time consuming method of data collection when compared to the use of a focus group or
questionnaire, however more information can often by gathered through the use of an interview (Cohen et al., 2011). Furthermore, the use of an interview allows for the clarification and further exploration of participants’ responses through the use of prompts and probes. This was of particular value to the present study and therefore justified the time spent using an interview format to gather data. There have been a number of strengths and weaknesses described regarding the use of a standardised open-ended interview format (Patton, 1980). The main limitation of using this interview format in the present study was the lack of flexibility regarding the wording and sequencing of questions in the interview schedule, which may have constrained the naturalness and informality of the conversation. However, the use of a standardised open-ended interview format allows data to be gathered in a systematic manner and facilitates the organisation and analysis of data from multiple interviews (Cohen et al., 2011). The present researcher, therefore, concluded that the use of a standardised open-ended interview format was the most appropriate method of data collection for the present study.

3.10.3 Data analysis method

The present study used thematic analysis to analyse the interview data. Braun and Clarke (2006) posited that thematic analysis is a ‘relatively straightforward form of qualitative analysis’ (pp. 94), which is suitable for researchers still learning qualitative techniques. However, there are also a number of potential pitfalls and disadvantages that are detailed by the researchers:

i. The flexibility of thematic analysis can lead to poorly conducted analyses, for example simply providing a summary of extracts with a little or no analytic narrative.

ii. Thematic analysis can become overwhelming to the researcher due to the broad range of themes that can often be coded and subsequently reported.

iii. Thematic analysis can have limited interpretative power if not being used in existing theoretical framework.

iv. Thematic analysis is unable to reveal inconsistencies and contradictions within and between individual accounts.
v. Thematic analysis does not analyse participants’ language use or the functionality of talk.

However, the present research did not seek to compare the accounts of participants and was not concerned with participants’ functionality of talk. Furthermore, the present researcher minimised the risk of becoming overwhelmed by the data by using Computer Assisted Qualitative Data Analysis Software (CAQDAS), NVivo, to aid data coding. Moreover, the present researcher reduced the risk of conducting a poor analysis of the data by ensuring careful consideration of the analysis and adhering to Braun and Clarke’s (2006) six stage model. Attride-Stirling (2001) argued that providing researchers are explicit about the process via which they conduct their analysis, the use of thematic analysis ‘enables a methodical systematisation of textual data, facilitates the disclosure of each step in the analytic process, aids the organization of an analysis and its presentation, and allows a sensitive, insightful and rich exploration of a text’s overt structures and underlying patterns’ (pp. 386).

However, there are a number of other qualitative approaches to analysing interview data. One such approach has been termed interpretative phenomenological analysis (IPA) (Smith, 1996). IPA ‘aims to explore in detail participants’ personal lived experience and how participants make sense of that personal experience’ (Smith, 2004, pp.40). This type of analysis allows for in depth analysis of participants’ functionality of talk and although IPA remains grounded in the text level it also ‘moves beyond the text to a more interpretative and psychological level’ (Smith, 2004, pp. 44). In the present study, however, the analysis did not seek to move beyond the surface text level as the research questions did not require an analysis of participants’ talk at a psychological level. The present researcher, therefore, concluded that thematic analysis was the most appropriate qualitative method of data analysis for the present study.
Chapter 4

Findings

4.1 Overview of chapter

This chapter provides a description of the findings from the thematic analysis outlined in Chapter 3. As discussed in section 3.5.4.2, the findings are presented according to the present study’s research questions:

1. What experiences and conceptualisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?

2. What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?

3. What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?

Each research question (RQ) will be taken in turn and the themes identified from the data analysis presented. As detailed within figures 4.2, 4.3 and 4.4 a thematic map is presented for each research question to illustrate the themes that emerged from the data set. A hierarchical system of themes was used meaning that initial codes were organised into ‘subthemes’, subthemes organised into ‘basic’ themes, and basic themes arranged into overarching concepts, termed ‘organising’ themes (see Figure 4.1). All subthemes, basic themes and organising themes are supported by direct quotes from the data set. The chapter concludes with a summary of the findings.
Figure 4.1 Hierarchy of themes.

4.2 Research Question 1

What experiences and conceptualisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?

As seen in figure 4.2, the data from the interviews yielded six organising themes for RQ1. RQ1 will be answered by discussing each organising theme and its associated basic and subthemes separately.
Figure 4.2 Thematic map for RQ1.
4.2.1 Organising theme 1: Conceptualisations

A number of subthemes were identified that related to participants’ conceptualisations of unusual sensory responses in children with ASC. These subthemes were classified by the present author as being at a behavioural level, meaning the behaviours demonstrated by children with ASC that participants attributed to having a sensory function, and a cognitive level, meaning the cognitive processes that participants believed to underlie such behaviours. Therefore, the subthemes gave rise to two basic themes: behavioural level and cognitive level. These basic themes then yielded the organising theme that was termed ‘conceptualisations’.

4.2.1.1 Basic theme: Behavioural level

A number of participants conceptualised unusual responses to sensory stimuli in children with ASC in terms of observable behaviours. Within this basic theme a number of subthemes were identified.

4.2.1.1.1 Subtheme: Individual senses

Observable behaviours were frequently discussed in terms of the seven sensory systems: hearing, touch, smell, taste, sight, balance and movement.
Many participants gave behavioural descriptions of unusual sensory responses with regards to individual senses.

<table>
<thead>
<tr>
<th>Quote</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>“He couldn’t stand eating his dinner with the rest of the children; it was noisy. He would often put his hands over his ears; he had this amazing way of folding his ears inside themselves, so he made his own kind of little headphones”</td>
<td>OT1</td>
</tr>
<tr>
<td>“There are people who want that, sort of, to touch things unusually, you know, and may want to, you know, come up and rub your blouse if you’ve got a particular blouse on, things like that, and other people who do not want to be touched at all, or touch things, you know, that are quite, sort of, reluctant to touch anything”</td>
<td>ST1</td>
</tr>
<tr>
<td>“Smell, we’ve got young people who like to smell feet and shoes, and have an interest in that. We’ve also got people who can’t…you know, and certainly, I’ve come across this in mainstream schools as well, who can’t be near anything that smells strong, so any kind of perfume”</td>
<td>ST1</td>
</tr>
<tr>
<td>“Children who eat everything. Children who’ll eat nothing but they’ll eat the plaster from the wall. You know, extremes of behaviour. Children who’ll only eat one colour or one texture. Children who eat really spicy food. The whole gamut, really. Eating’s a big one, very common one”</td>
<td>EP1</td>
</tr>
<tr>
<td>“Some of our children find the whiteboards very glaring, or the lights in classrooms, or the differences in different areas of the school, so going from one area to another”</td>
<td>ST2</td>
</tr>
<tr>
<td>“With the, like, vestibular inappropriate receptive stuff, that might be more probably in the playground and during PE. They might have like a strong reaction to some of the PE activities if they’ve got to jump over a vault or things like that. Also they can have problems in the line, if they have to line up, if they don’t like being too close to them”</td>
<td>OT2</td>
</tr>
</tbody>
</table>

Table 4.1 Quotes evidencing Subtheme: Individual senses
4.2.1.1.2 Subtheme: Multiple senses

Observable behaviours were also described in terms of multiple sensory systems being affected at the same time in children with ASC. Some participants discussed these responses in terms of competition between different sensory domains and other participants described multiple senses being simultaneously stimulated, causing ‘sensory overload’.

“So they may not be able to look at people while they, and look and listen at the same time” (ST1)

“she [Temple Grandin] says sometimes when I’m in a supermarket and I’m having a good day I can look on a shelf and I can see a tin of beans...and it has significance, it’s a tin of baked beans, it’s a product, name, I understand that, I see that, I quite like beans, I like them with this, that and the other, all of that rich picture, has a significance when she’s having a good day. But she can have times within a supermarket where she’s starting to get information overload, which essentially is sensory overload, is not managed, is not filtered well, where that goes from significance to...I can’t remember the word that she used, but then it just kind of becomes a tin of beans. It’s a tin of beans. It’s a food product. It has a more concrete aspect to it. And sometimes when she’s having a real bad day, it becomes sensory. And what she does, it becomes, it’s a shape, it’s a solid shape, it has a sort of a cold, metallic taste. And she said that’s kind of how it works for her. She’s struggling with information overload” (EP2)

Table 4.2 Quotes evidencing Subtheme: Multiple senses

4.2.1.1.3 Subtheme: Attention

Some participants included attention and concentration difficulties in their conceptualisations of unusual sensory responses, such as difficulties sustaining attention and attention shift problems.
“I think from an educational point of view obviously we wanted to get him at the right of level or arousal so that he can pay a bit more attention to things that were happening” (OT1)

“I think that lots of kids on the spectrum, and again when I was around, I haven’t read as much recent research as you have, but there was the suggestion that kids struggle with that filtration, it’s that all or nothing response that there is a difficulty with attention shift” (EP2)

Table 4.3 Quotes evidencing Subtheme: Attention

4.2.1.1.4 Subtheme: Motor

Some participants included motor difficulties in their conceptualisations of unusual sensory responses.

“He walks on his tiptoes so he’s been given orthotic boots to try and address that” (EP1)

“I think, well I think, John does have sensory because the motor stereotypies with John are a kind of sensory need” (EP2)

Table 4.4 Quotes evidencing Subtheme: Motor

4.2.1.2 Basic theme: Cognitive level

As well as conceptualising unusual sensory responses in children with ASC in terms of observable behaviours in the classroom, a number of participants also conceptualised these responses in terms of theorised cognitive processes. Within this basic theme the following subthemes were identified.
4.2.1.2.1 Subtheme: Sensory processing and integration

A number of participants discussed cognitive conceptualisations of unusual sensory responses with reference to theories of information processing and sensory integration.

“That’s the sort of model that… I suppose SI [Sensory Integration] Network have presented and that we’ve kind of been looking at – you know, where you’ve got your sensory seekers, your sensory avoiders and then you’ve got your praxis on the other side. That’s the kind of… And it does, it does seem to fit into that. I’m not, you know, I’m not… don’t profess to be an expert, but definitely it seems to be working for me, giving me a framework” (OT1)

“Most children on the spectrum, I think can easily be described as having difficulty with information processing, whether at a general level, a social level, the research isn’t clear at this stage. But it’s definitely an issue around central coherence, executive functioning, even theory of mind. You know, these main theories that we as psychologists espouse are all at their core information processing difficulties” (EP2)

“See I think hypo/hypersensitivity isn’t to do with necessarily, although I could well be wrong, the nerve endings in your fingers. It’s about, for me, life existence inside our heads, which is why I buy into this information processing issue. It doesn’t happen at the end of our fingers, it doesn’t happen at that level” (EP2)

Table 4.5 Quotes evidencing Subtheme: Sensory processing and integration

4.2.1.2.2 Subtheme: Hyper-hypo continuum

When conceptualising unusual sensory responses, a number of references to a continuum of sensory threshold in each sense were made by participants, with the extremes of the continuum labelled as hyper- and hyposensitivity.

“That’s your threshold, isn’t it?” (ST1)
“So really, I think, you know, the whole range, in terms of, you know, whatever the sense is, there’s somebody at either end of it, I think” (ST1)

“There are a lot of children that can be avoiding in one sensory system, but seeking in another” (OT1)

Table 4.6 Quotes evidencing Subtheme: Hyper-hypo continuum

4.2.1.2.3 Subtheme: Other cognitive processes

One participant discussed a number of other cognitive processes that they felt could act as mediators of unusual sensory responses in children with ASC. ‘Effortfulness’ was described as perhaps being a cognitive process that could mediate unusual sensory responses, in that there could be higher chance of sensory overload when a person’s effortfulness is hampered by tiredness or illness. Another theorised mediator was the amount of cognitive stress a person is experiencing during the time of sensory stimulation. This participant conceptualised unusual sensory responses as being a complex phenomenon and did not agree with a reductionist perspective that unusual sensory responses were purely to do with sensory thresholds.

“And that kind of, so we all have situations from time to time when you’ve got a hangover or you’re tired when our ability to manage things is impaired, our effortfulness becomes less and we manage it, we all do what Donna Williams is talking about, we shut down things, or things are shut down” (EP2)

“At different times. Just like we all react in different ways depending on the stress level, the demands that are placed upon us. It is very fluid in that sense, there is no, which is why I do struggle sometime with this sort of yes/no switch mentality to these sort of things because it’s variable” (EP2)

Table 4.7 Quotes evidencing Subtheme: Other cognitive processes
4.2.2 Organising theme 2: Assessment

Within the interviews a number of difficulties assessing unusual sensory responses in children with ASC were voiced. Three basic themes were identified: constraints of assessment tools, hypothesis testing and professional constraints. An organising theme that was termed ‘assessment’ was then yielded from these basic themes.

4.2.2.1 Basic theme 1: Constraints of assessment tools

Many of the participants voiced constraints regarding the tools available for assessing unusual sensory responses in children with ASC. Participants felt that assessment often relied on parental reports, which could give rise to issues of reliability and validity. A number of participants commented that diagnostic ASC assessment tools do not provide in depth information regarding a child’s sensory needs. Furthermore, some participants felt that even those assessment tools developed specifically for assessing unusual sensory responses, such as standardised checklists, did not map well onto their practice and did not provide useful information for practitioners. Some practitioners discussed the use of observation as an assessment tool, however acknowledged the limitations of using this as a method of assessment. Participants also voiced difficulties with assessing the unusual sensory
responses of children with ASC in terms of classifying behaviours as having a sensory function as opposed to an alternative function.

<table>
<thead>
<tr>
<th>“Well, again, because I work with little ones, they often, they don’t comment, so it’s hard to know. And it's one where you're relying on parents making a best guess” (EP1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Also the parents are filling it in so you're not always sure how accurate their answers are. You know, I always say to them try and answer honestly but I say it's no help to us if you just think, right, I'm going to say that they've got everything really bad, just so we get more help” (OT2)</td>
</tr>
<tr>
<td>“We’re increasing the number of people who are ADOS trained, but the ADOS doesn't look at sensory issues particularly, which is a bit of a shame” (EP1)</td>
</tr>
<tr>
<td>“The only information that we have available is a rather cursory report from the pathway, which largely just states that he's got Asperger's...very medical. Gives no real suggestion as to the nature of the difficulties” (EP2)</td>
</tr>
<tr>
<td>“We have got the sensory profile here; the Winnie Dunn sensory profile but I don't find it that useful really. It doesn't really give you the information that you need....doesn't break it down very well and there's too many different categories.... and it, kind of, seems to overlap with some of the physical stuff” (OT2)</td>
</tr>
<tr>
<td>“But no, at the moment, it tends to be very much, you know, an observational type thing. And of course, that...there are some issues with that, because some people obviously are much more tuned in and much more aware” (ST1)</td>
</tr>
<tr>
<td>“I find it very difficult I suppose to try and disentangle an assessment about what's going on generally and specifically a sensory issue” (EP2)</td>
</tr>
</tbody>
</table>

Table 4.8 Quotes evidencing Basic theme 1: Constraints of assessment tools

4.2.2.2 Basic theme 2: Hypothesis testing

Some participants discussed using a hypothesis testing approach on a case by case basis to assess unusual sensory responses due to the individual nature of
responses and constraints of assessment tools (as discussed in previous

section).

“You know, we’re trying to, sort of…it’s a bit of a problem-solving effect
sometimes; you’re presenting them, to see is that what’s causing the problem?”
(ST1)

“There was a kid, again in a SLD school, who wouldn’t go into the assembly,
and it was all we know why, he’s got autism and he doesn’t like the acoustics
and all this sort of stuff, and so okay, we managed that and give him some sort
of, something that softens the acoustics or even blocks the acoustics. Didn’t
make the slightest bit of difference at all, we just kept trying to get a sense of
what was going on and in the end it turned out that it was a cheese plant at the
side of the hall and this poor lad had been abused, sexually abused, and
associated the cheese plant with the cheese plant in the room where he’d been
abused” (EP2)

Table 4.9 Quotes evidencing Basic theme 2: Hypothesis testing

4.2.2.3 Basic theme 3: Professional constraints

Constraints regarding the role of Occupational Therapists (OTs) within
assessment were raised by participants with regards to the logistics of sensory
assessments and a lack of designated professionals trained to conduct
sensory assessments of children with ASC.

“You could do with talking to the parent first on their own without the child
there so that when the child came you could start doing your assessment, you
know, in a bit more of a focused way but we don’t really have that luxury”
(OT2).

“We have OTs that are being trained up to do that work, but we don’t currently
have, it is a gap I think, we don’t have designated professionals” (EP2)

Table 4.10 Quotes evidencing Basic theme 3: Professional constraints
4.2.3 Organising theme 3: Defining unusual sensory responses

Within the interviews many participants discussed issues regarding the definition of unusual sensory responses. These issues gave rise to four basic themes: difficulty defining responses, ambiguous nature of unusual sensory responses, difficulty distinguishing from triad of impairments and differing professional interests. These basic themes yielded the organising theme that was termed ‘defining unusual sensory responses’.

4.2.3.1 Basic theme 1: Difficulty defining responses

Many participants highlighted difficulties defining unusual sensory responses in children with ASC due to the complex nature of these behaviours and blurred distinctions between the physiological, behavioural and cognitive processes underlying unusual sensory responses.

“\textit{I think she does have sensory issues, but they're not very straightforward in terms of, I don't like loud noises, or I don't like... you know}” (ST1)
“It’s how you define sensory… yeah. See senses, where do you feel things? (points to head) you don’t feel them there (points to fingers). You know the blind man feels things just from the end of a stick” (EP2)

“So I don’t necessarily know about distinguishing line, between a sensory issue and an information processing issue because I’m not sure I can do that or whether it can be done” (EP2)

Table 4.11 Quotes evidencing Basic theme 1: Difficulty defining responses

4.2.3.2 Basic theme 2: Ambiguous nature of unusual sensory responses

Many participants also highlighted the ambiguous nature of unusual sensory responses with regards to the individuality of responses and counter intuitive presentations.

“It’s that difficulty of how sensory needs vary between people, I can’t tell you what they’ll have difficulty with. You know, it is very individual, and the other main thing is the fact that it can vary with one person during the day” (ST1)

“And yet, the same child who hates the noise can be the child who creates a lot of noise” (EP1)

“He was kind of just about managing to hold it together at school, but at home he would walk around with no trousers” (OT1)

Table 4.12 Quotes evidencing Basic theme 2: Ambiguous nature of unusual sensory responses

4.2.3.3 Basic theme 3: Difficulty distinguishing from triad of impairments

One participant discussed the difficulties they had experienced distinguishing between the behavioural presentations of unusual sensory responses and those of the triad of impairments, specifically rigidity of thought.

“If the little sister was singing at breakfast time, so she was eating and singing,
again she'd verbalise that you don't sing when you're eating. So again, it wasn't necessarily sensory, it was, you know, that's not what you do when you're eating” (EP1)

“And again, only ate off one plate or a particular kind of cup or again, mixed in with that rigidity. Will only eat one brand of crisps, and can tell from the taste that you've not bought the brand they like” (EP1)

Table 4.13 Quotes evidencing Basic theme 3: Difficulty distinguishing from triad of impairments

4.2.3.4 Basic theme 4: Differing professional interests

Participants voiced that in their experience practitioners from different professions are interested in different aspects with regards to defining unusual sensory responses in children with ASC. One participant discussed an upcoming training session being delivered by the Occupational Therapy (OT) service and felt that medical professionals would be interested in the neurophysiological aspects of unusual sensory responses, whereas other professionals, including herself as a Specialist Educational Psychologist, would be more interested in practical intervention strategies. Another participant felt that the difficulties in defining unusual sensory responses in children with ASC may stem from the differing terms used to promote the varying conceptualisations of these responses.

“So they've got quite a mixed audience, so there should be some literature as well as a practical. And the doctors, of course, will be interested in the kind of neurology” (EP1)

“Different people, different nomenclatures used by different people to promote their particular ways of seeing things” (EP2)

Table 4.14 Quotes evidencing Basic theme 4: Differing professional interests
4.2.4 Organising theme 4: Pragmatism

Within the interviews many of the participants discussed the pragmatic issues involved in translating a developing evidence base into practice, managing their professional role and engaging in continuing professional development. These issues gave rise to four basic themes: assessment and intervention, research literature, professional role and continuing professional development. These basic themes yielded the organising theme that was termed ‘pragmatism’.

4.2.4.1 Basic theme 1: Assessment and intervention

One participant discussed the need to make intuitive decisions in their professional role due to the underdeveloped evidence base regarding the assessment and support of unusual sensory responses in children with ASC in educational settings. Another participant voiced a number of issues specifically regarding the assessment of unusual sensory responses in children with ASC. The participants discussed the compromises they have had to make in their practice regarding the lack of OTs trained to carry out sensory assessments and their pragmatic use of formal assessment tools as a way of raising
awareness of possible sensory needs in schools as opposed to attempting to catalogue such needs.

“It’s been a bit of guesswork, really, and I think that’s still the case, often, that, you know, a lot of it is, sort of, we’re doing what we think is the right thing” (ST1)

“Well pragmatically, we can refer on to OT. I do refer on to OT. Just because OT cannot provide the service currently does not mean to say that if I identify that as a need and that is the service that is probably best placed to provide for that need then I will still refer on. And it’s actually placing that sense of a need within OT creates situations where they will then look to develop it” (EP2)

“What I do want to give, say is this sense of having a look at what are the sensory issues, I have no idea if it’s based on a model, and it’s [sensory checklist] one of those things that you have in your bag” (EP2)

Table 4.15 Quotes evidencing Basic theme 1: Assessment and intervention

4.2.4.2 Basic theme 2: Research literature

Both of the OTs interviewed discussed the difficulties they have experienced translating a developing evidence base into practice. It was voiced that these difficulties had led to participants’ pragmatic use of literature within everyday practice and development of practice based evidence. One participant discussed the work of Miller et al. (2007), however, was unsure of the extent to which the children she saw in her practice fitted this proposed model. The participant was also unsure of whether or not in practice parents of children with ASC experiencing unusual sensory responses necessarily wanted such a classification.

“When you see a theory you think, oh, yes, that makes perfect sense. And then when you see a child, actually, you know, it’s… sometimes it’s… sometimes it’s so classic that it’s… But often it’s more complicated than that, isn’t it? So I think you kind of take that maybe as a base and then from that you develop
Table 4.16 Quotes evidencing Basic theme 2: Research literature

4.2.4.3 Basic theme 3: Professional role

Many of the participants voiced that they had had to act as pragmatists within their professional role. Some participants discussed this in terms of having to build giving advice on sensory issues into their role due to the lack of access to more specialised practitioners. The OTs also discussed pragmatism in terms of having to use sensory integration therapy, as opposed to other intervention strategies, in response to client demand.

“In the absence of OT, which has been the case before this year, you know, obviously we did our best with what we thought, you know” (ST1)

“And you might give advice, because the numbers are increasing so much that the specialist teams are very stretched” (EP1)

“So we have to use it [sensory integration therapy] more because, you know, we have to respond to what people want I suppose” (OT2)
4.2.4.4 Basic theme 4: Continuing professional development

Many participants also voiced that they found it difficult to build adequate opportunities for continuing professional development into their professional role regarding children with ASC experiencing unusual sensory responses. Therefore, this had led to them making pragmatic decisions regarding what kind of literature they chose to read and had impacted on their level of conscious competence in everyday practice.

| “But I haven’t actually got round to it yet because I’m still seeing children and writing reports” (EP1) |
| “And I think that’s why it’s [Olga Bogdashina’s book] so useful because it’s easy to read, and I think for staff who are very busy and who are…it’s very easy for them to look at that and go, yes, you know, that’s just what we see, you know, that kind of thing” (ST1) |
| “The reading I’ve done so far has tended to be more practical than research. You know, what can we do to address it” (EP1) |
| “Yes they [practitioners] should have, in an ideal world they should be consciously competent, they should understand the framework that, I should understand the framework behind this tool that I’m dishing out to people” (EP2) |

Table 4.18 Quotes evidencing Basic theme 4: Continuing professional development
4.2.5 Organising theme 5: Impact at school

Within the interviews many of the participants discussed the impact that they felt experiencing unusual sensory responses had on children with ASC within an educational setting. The organising theme arose from four basic themes: access to the curriculum, peer relationships, transition, and behaviour.

4.2.5.1 Basic theme 1: Access to the curriculum

A number of participants voiced that in their experience some children with ASC had struggled to access the curriculum due to experiencing unusual sensory responses. Some participants discussed this in terms of accessing certain learning activities within the curriculum (particularly with regards to the Early Years Foundation Stage), whilst other participants discussed this more broadly in terms of children missing out on the curriculum entirely due to not wanting to be in classrooms and school refusal.

“And I think that the foundation stage doesn’t necessarily work well for our children. Because of the continuous provision, some of our children will choose to be outside by themselves in the quietest corner possible” (EP1)

“In terms of little ones, you know, where you’re wanting to do sand and water
play and things like that, there will either be that not wanting to come out of the water play or the sand play, or the not willing to put your hand into it, you know, which, either way, it affects access to the curriculum” (ST1)

“And I think the sensory issues have got something to do with that, certainly, in terms of being in classrooms with a number of other young people, there is an issue. And that obviously has an impact, because she will take herself out of the classroom” (ST1)

“Yes, that [sensory overload] was one of the reasons why she wouldn’t go to school” (ST2)

Table 4.19 Quotes evidencing Basic theme 1: Access to the curriculum

4.2.5.2 Basic theme 2: Peer relationships

A number of participants commented that they had experienced children with ASC experiencing unusual sensory responses being bullied by other children in school and that their sensory responses sometimes negatively affected their peer relationships.

“That drew attention to her [wanting school skirt very tight], actually, as a pupil. She was rather overweight, and I think the other children, she felt the other children didn’t… You know, she was bullied, effectively” (ST2)

“Or, you know, they may sit there humming, they might there tapping their foot and that can be kind of quite annoying to the other children that they’re around” (OT1)

“You know, lots of children, like, hit out in frustration or when they’re upset, you know, will hit the other children in the class and things like that” (OT2)

Table 4.20 Quotes evidencing Basic theme 2: Peer relationships.
4.2.5.3 Basic theme 3: Transition

Some participants discussed their experiences regarding the negative impact unusual sensory responses in children with ASC had on transitions between educational settings.

| “She was in a very quiet nursery, in a small group in a very quiet nursery. There were only about half a dozen children in the group. And is going into school in September, so we’ve got a lot of concerns about her” (EP1) |
| “The sensory experiences become more heightened after transition, because of the size of a high school building, because of the moving around” (ST2) |

Table 4.21 Quotes evidencing Basic theme 3: Transition.

4.2.5.4 Basic theme 3: Behaviour

A number of participants felt that unusual sensory responses in children with ASC sometimes linked with them demonstrating challenging behaviours in school.

| “Well, challenging behaviour is the biggest one [impact]. You know, the extreme behaviours these children sometimes exhibit” (EP1) |
| “And you know, thinking back to one young man who, you know, did this constant screaming, and really, it was, he was so overwhelmed in a sensory manner, that he would scream” (ST1) |
| “Sort of some self-injurious behaviours where they’re main… the kind of head-banging when he got particularly frustrated” (OT1) |

Table 4.22 Quotes evidencing Basic theme 3: Behaviour.
4.2.6 Organising theme 6: Professionals’ roles

Within the interviews all of the participants described their professional role with regards to unusual sensory responses experience by children with ASC. This professional role was discussed in terms of the nature of the work carried out and also the differences between the roles of practitioners from different professions. Six basic themes were identified from the data: assessment, consultation, intervention, training, multiagency work and differing roles. These basic themes yielded the organising theme that was termed ‘professionals’ roles’.

4.2.6.1 Basic theme 1: Assessment

A number of the professionals voiced that their role involved assessment of unusual sensory responses in children with ASC within an educational setting. In particular, the OT role in assessment was highlighted, with participants reporting that OTs often went into educational settings to gather further assessment information.

“So my role is to go in and to highlight those possibilities, to observe a child,
and to say, do you know what? I think it might be... And to encourage them to fill in a checklist, to look at possibilities, and to just consider it as part of their overall observation techniques to say, could it actually be something sensory that we aren’t picking up on, because they can’t say?” (ST2)

“Well, I suppose it [OT role] would be an assessment of exactly what their sensory needs are” (OT2)

“Because what we’ve had is, you know, OTs coming in, having a look at some of our pupils, look at some of the behaviours, some of the way that they operate within the classroom, and looking, you know, what do they seem to be seeking?” (ST1)

“What I want to do is to go into school and find out any more of those types of behaviours that he’s exhibiting” (OT1)

Table 4.23 Quotes evidencing Basic theme 1: Assessment

4.2.6.2 Basic theme 2: Consultation

All of the participants discussed the use of consultation as being part of their role with regards to working with children with ASC experiencing unusual sensory responses in educational settings. The main aspects of consultation discussed appeared to be raising awareness at school and home of unusual sensory responses and giving advice to school staff and parents. A number of participants also discussed the use of consultation with regards to being a ‘critical friend’ to schools, meaning they used consultation in order to challenge practice and encourage schools to adopt new ways of supporting children with ASC experiencing unusual sensory responses.

“So we, you know, we use a consultation model” (EP1)

“A lot of it is through advice, and on-going advice, and observation and feedback” (ST1)

“I think our role is more about sort of trying to educate other people, really, to enable them” (OT2)

“That would be advice to the parents and advice to the school about the
strategies and activities they could do that may or may not help the child to regulate their behaviour and then we would follow that up, you know, see how they were getting on and then that would be it really so, kind of, more of an assessment than advice overall really rather than, kind of, hands-on, practical intervention with them” (OT2)

“You know, it’s about supporting, but it’s also about challenging and saying, you know, really, it’s not going to work for that child” (ST1)

“So the things like persuading them to let children use fiddle objects or you know, sensory objects within the classroom, and also getting that as an accepted part of mainstream provision” (ST2)

Table 4.24 Quotes evidencing Basic theme 2: Consultation.

4.2.6.3 Basic theme 3: Intervention

The majority of participants also discussed their role with regards to interventions for children with ASC experiencing unusual sensory responses. A number of participants voiced that direct treatment or therapeutic intervention was not part of their role. Instead, participants often discussed their role in intervention as devising strategies to manage, as opposed to remediate, such responses at school and home. However there were some aspects of direct intervention that participants had carried out in their role. One specialist teacher described her experiences of modelling sensory activities and desensitisation strategies to teaching and support staff. One participant conceptualised her role in intervention as supporting the implementation of strategies given by other professionals.

“I think our role is very much identifying what sensory systems are involved and then trying to develop sensory strategies for school and home” (OT1)

“We don’t really provide treatment as such. It’s more advice” (OT2)

“I think it’s probably, my view about psychologists is that we’re not interveners, we’re consultants, we advise and we signpost” (EP2)

“However, we have done some role modelling, and we also have a TA who we
send out, as well, who will do, sort of, lots of sensory type activities with the children, to show the kind of things that we would do, and particularly if we're trying to introduce activities and perhaps desensitise people and get them used to doing things” (ST1)

“Although, I think as psychologists, particularly working in a multi-disciplinary team, I think often... I find my role is about... because the OTs and the speech therapists, to a degree, will give good advice on what to do, but not on how to do it. And I often find the parents... it's the how to that parents need from us. So they may know what to do but they don't know how to do it, so it fails” (EP1)

Table 4.25 Quotes evidencing Basic theme 3: Intervention.

4.2.6.4 Basic theme 4: Training

One participant spoke of their role in training school staff about the unusual sensory responses of children with ASC and one participant voiced that they were due to attend a training session being given by the OT service in their Local Authority (LA).

“Well, to go into a school and to train them and to inform them, and to give them advice, and to impart knowledge, really” (ST2)

“Our OTs are going to do some training fairly soon, which I'm hoping to attend” (EP1)

Table 4.26 Quotes evidencing Basic theme 4: Training.

4.2.6.5 Basic theme 5: Multiagency work

Many of the participants discussed their role with regards to multiagency working and cooperation. Some participants described this with respect to being part of a multidisciplinary ASC team and others in terms of joint cooperation during individual casework.
\[\text{“Because I’m part of the multi-disciplinary team, we’ve got paediatricians, it’s a teaching hospital so we’ve got doctors who are in training, OTs, physios, speech therapists” (EP1)\]}

\[\text{“I do a little bit at the hospital, and I don’t make diagnoses, but I contribute because I obviously can see…I’ve seen the child in the school environment, and it’s interesting there that quite often there’s a little bit more talk about the sensory stuff” (ST2)\]}

\[\text{“Again, one of our advisory teachers has observed him in nursery and passed the information to me” (EP1)\]}

\[\text{“I did a few sessions prior to him having his speech and language therapy, so in order just to see if he was a bit calmer, if he was a bit more responsive and a bit kind of ready more ready to learn” (OT1)\]}

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<tr>
<th>Table 4.27 Quotes evidencing Basic theme 5: Multiagency work.</th>
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**4.2.6.6 Basic theme 6: Differing roles**

Within participants’ descriptions of their professional role, a number of differences between the roles of practitioners from different professions were identified. The differences mainly centred around the length of time they were involved with a child experiencing unusual sensory responses, however one participant, a Specialist Educational Psychologist, also felt her role differed from others in terms of its holistic nature.

\[\text{“And because of the way our service works, we don’t tend to have an on... we try very hard to have an ongoing role, but we don’t tend to usually” (EP1)\]}

\[\text{“So I think again, [specialist teacher’s] team will have more ongoing with some children” (EP1)\]}

\[\text{“But I think that’s often our role as part of a multi-agency team, kind of putting the child back together again from all the different bits” (EP1)\]}

| Table 4.28 Quotes evidencing Basic theme 6: Differing roles. |

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4.2.7 Summary of findings for Research Question 1

What experiences and conceptualisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?

The data from the interviews yielded six organising themes for RQ1, with each organising theme arising from a number of basic themes and subthemes (see Figure 4.2).

Organising themes for RQ1:
- Conceptualisations
- Assessment
- Defining unusual sensory responses
- Pragmatism
- Impact at school
- Professionals’ roles

Within the interviews a number of conceptualisations of unusual sensory responses in children with ASC were voiced. A number of participants conceptualised unusual responses to sensory stimuli in children with ASC in behavioural terms. These behaviours tended to be discussed with regards to individual sensory domains, multiple sensory systems being affected at the same time (sensory overload), attention and concentration difficulties and motor difficulties. As well as conceptualising unusual sensory responses in children with ASC in terms of observable behaviours in the classroom, participants also conceptualised these responses in terms of cognitive processes. The cognitive processing and integration of sensory stimuli was discussed, sometimes with reference to Ayres’ theory of sensory integration (1972). A number of references to a continuum of sensory threshold and hyper- and hyposensitivity were also made, reflecting aspects of Dunn’s (1997) model. One participant also theorised that other cognitive processes could act as mediators of unusual sensory
responses in children with ASC, such as cognitive ‘effortfulness’ or the level of cognitive demand being experienced at the time of stimulation. This participant conceptualised unusual sensory responses as being a complex phenomenon and did not agree with a reductionist perspective that unusual sensory responses could be explained in terms of unitary cognitive processes.

A number of difficulties assessing unusual sensory responses in children with ASC were voiced. Participants felt that diagnostic ASC assessment tools do not provide in depth information regarding a child’s sensory needs. Furthermore, some participants felt that even those assessment tools developed specifically for assessing unusual sensory responses, such as standardised checklists, did not map well onto their practice and did not provide useful information for practitioners. Some practitioners discussed the use of observation as an assessment tool, however acknowledged the limitations of using this as a method of assessment with regards to classifying behaviours as having a sensory function as opposed to an alternative function. Some participants therefore discussed taking a hypothesis testing approach to the assessment of unusual sensory responses in children with ASC. Constraints were also raised with regards to the logistics of sensory assessments and a lack of designated professionals trained to conduct sensory assessments of children with ASC.

Many of the participants discussed issues regarding the definition of unusual sensory responses. Participants highlighted the complex nature of these responses and blurred distinctions between the physiological, behavioural and cognitive processes underlying unusual sensory responses. The ambiguous nature of unusual sensory responses with regards to the individuality of responses and counter intuitive presentations was also discussed. Difficulties were identified with distinguishing between the behavioural presentations of unusual sensory responses and those of the triad of impairments, specifically rigidity of thought. Furthermore, participants voiced that difficulties defining unusual sensory responses were compounded by the different outlooks and use of terminology between professions.
Within the interviews the pragmatic issues involved in translating a developing evidence base into practice, managing professional roles and engaging in continuing professional development were highlighted. Participants discussed the difficulties they had experienced translating a developing evidence base into practice with regards to the assessment of and intervention for unusual sensory responses. These difficulties had led to participants’ pragmatic use of literature within everyday practice and their use of practice based evidence. For example, one participant discussed the work of Miller et al. (2007), however, was unsure of the extent to which the children she saw in her practice fitted this proposed model. Many of the participants also voiced that they had had to act as pragmatists within their professional role, for example incorporating advice giving into their role due to the lack of access to more specialised practitioners and having to make compromises regarding the interventions they provided to children with ASC experiencing unusual sensory responses. It was also voiced that participants found it difficult to build adequate opportunities for continuing professional development into their role, which they felt impacted on their level of conscious competence in everyday practice.

A number of participants discussed the impact that they felt experiencing unusual sensory responses had on children with ASC within an educational setting. Participants voiced that in their experience some children with ASC struggled to access the curriculum due to experiencing unusual sensory responses. It was also highlighted that children with ASC experiencing unusual sensory responses were sometimes bullied by other children in school and that their sensory responses sometimes negatively affected their peer relationships. Difficult transitions between educational settings due to changes in the sensory environment were also discussed. Furthermore, a number of participants felt that unusual sensory responses in children with ASC sometimes led to challenging behaviour in school.

Within the interviews all of the participants described their professional role with regards to unusual sensory responses experience by children with ASC. Professional roles included the assessment of unusual sensory responses in children with ASC within an educational setting. Consultation was also used as a means of raising awareness, providing advice, challenging practice and
encouraging schools to adopt new ways of supporting children with ASC experiencing unusual sensory responses. Intervention for children with ASC experiencing unusual sensory responses was often discussed in terms of devising strategies to manage unusual sensory responses as opposed to direct therapeutic intervention. Delivering training was also seen as part of the professional role for supporting children with ASC experiencing unusual sensory responses in school. Many of the participants discussed their role with regards to multiagency working and cooperation. Some participants described this with respect to being part of a multidisciplinary ASC team and others in terms of joint cooperation during individual casework. A number of differences between the roles of practitioners from different professions were also identified, such as the length of time they were involved with a child and the breadth of focus.

4.3 Research Question 2

What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?

As seen in figure 4.3, the data from the interviews yielded three organising themes for RQ2. RQ2 will be answered by discussing each organising theme and its associated basic and subthemes separately.
4.3.1 Organising theme 1: Interventions
Within the interviews a number of subthemes were identified relating to interventions used by participants to support children with ASC experiencing unusual sensory responses. These interventions were aimed at either remediating the unusual sensory responses or managing these responses within an educational context. Therefore, two basic themes were yielded: remediating responses and managing responses. This led to the identification of the organising theme termed ‘interventions’.

4.3.1.1 Basic theme 1: Remediating responses

A number of participants discussed interventions to remEDIATE unusual responses to sensory stimuli in children with ASC. Within this basic theme a number of subthemes were identified.

4.3.1.1.1 Subtheme 1: Specialist equipment

A number of participants made reference to specialist equipment used within educational settings to try and remediate the unusual sensory responses experienced by children with ASC.

| “I mean, we have looked at things like lycra suits for some children. Sloping boards, those kinds of things” (EP1) |
| —————————————————— |
| “There’s Move and Sit cushions which are wedge cushion with bobbles on that are filled with air so if you’ve got a real fidgeter they can get some of that feedback without standing up and, you know, being really disruptive to their peers” (OT2) |
| —————————————————— |
| “There’s a lot of the use of the scooter boards for the movement, and things like that” (ST1) |
| —————————————————— |
| “You know, the swinging in a blanket, or the, you know, the weighted blankets, and the snakes and things like that” (ST1) |

Table 4.29 Quotes evidencing Subtheme 1: Specialist equipment.
4.3.1.1.2 Subtheme 2: Sensory diet

A number of participants voiced that they had experienced sensory diets being used as a therapeutic intervention within an educational setting.

| “And we have had specialist OTs writing a sensory diet for children” (EP1) |
| “We kind of set up a sensory diet programme where he had lots mainly appropriate sensory activities. We looked at the times of the day that were particularly difficult for the little boy and tried to slot in some deep proprioceptive and some vestibular canvass, vestibular activities into his day, particular prior to the times that he found difficult” (OT1) |
| “It might be, like, in the form of a sensory diet so specific activities built into the school day, you know, like if after lunchtime’s a bit of a flashpoint then try and build something in before then to try and avoid those sorts of situations” (OT2) |

Table 4.30 Quotes evidencing Subtheme 2: Sensory diet.

4.3.1.1.3 Subtheme 3: Sensory rooms

The use of sensory rooms in educational settings was discussed by a number of participants as a way of providing children with ASC experiencing unusual sensory responses with tailored therapeutic activities.

| “We have got a sensory room” (ST1) |
| “In a special school environment, they have fantastic sensory rooms” (ST2) |
| “I’ve seen…been in special schools where I’ve seen the hydrotherapy pool in action, and the sensory room in action, and I can see that that’s a more direct therapy” (ST2) |

Table 4.31 Quotes evidencing Subtheme 3: Sensory rooms.
4.3.1.1.4 Subtheme 4: Sensory integration therapy

A number of participants discussed the use of activities in school based on sensory integration therapy for children with ASC experiencing unusual sensory responses, however no participants had experienced formal sensory integration therapy being delivered within an educational setting.

“There’s been some sensory issues around or perceived sensory issues around her difficulties, and [a private sensory integration clinic] came up with the medley of things that needs to be done. You know certain postural things, then there’s balls to be sat on, rocking and ways of, sort of, what are they called, blankets kind of enclosing them” (EP2)

“So things like... probably proprioceptive activities where you might get them squashed between a couple of mats or do some pushing with a therapy ball or a trickle ball with a piece of elastic or even just putting your hands on your head and pressing down” (OT2)

Table 4.32 Quotes evidencing Subtheme 4: Sensory integration therapy.

4.3.1.1.5 Subtheme 5: Gradual desensitisation

Gradual desensitisation to stimuli provoking an unusual sensory response in children with ASC was also discussed as an intervention strategy utilised in educational settings.

“If the child couldn’t cope with assembly, they would be allowed to sit just outside the door so that they were still part of it, and then they’d move them in gradually as the child could cope” (EP1)

“You know, so it will be very much that desensitisation, and so as I’ve said, you know, trying to get people to do it with gloves on, or you know, perhaps sit outside the door when the loud music’s playing, and gradually move inside, and that sort of thing...so it’s very much that desensitising” (ST1)

“We would advise them on strategies and on using techniques such as
introducing gradually” (ST2)

Table 4.33 Quotes evidencing Subtheme 5: Gradual desensitisation.

4.3.1.1.6 Subtheme 6: Sensory curriculum

One participant discussed the inclusion of sensory stimulation activities in the curriculum as an intervention strategy they had seen used in educational settings for remediating unusual sensory responses in children with ASC.

“And so I think, you know, with our pupils, throughout, really, the age range, we try and give them a lot of sensory input so they have those experiences” (ST1)

“We have had sensory, sort of, afternoons, where teachers have taken particular activities” (ST1)

Table 4.34 Quotes evidencing Subtheme 6: Sensory curriculum.

4.3.1.2 Basic theme 2: Managing responses

A number of participants discussed the use of interventions aimed at managing the unusual sensory responses experienced by children with ASC in educational settings. Within this basic theme a number of subthemes were identified.

4.3.1.2.1 Subtheme 1: Specialist equipment

A number of participants made reference to specialist equipment used within educational settings to try and manage the unusual sensory responses experienced by children with ASC.

“They used to use those little pop up Wendy houses with cushions and ear defender type things” (EP1)
“I suppose things that I know of, can think of that people have used in schools, the use of earphones to either soften or block out noise” (EP2)

“Well, they’re fidget toys. I mean there’s loads. You can get them online and things but even, like, just a piece of Blu Tack or a stress ball or Koosh ball that the child can, kind of, mess with” (OT2)

Table 4.35 Quotes evidencing Subtheme 1: Specialist equipment.

4.3.1.2.2 Subtheme 2: Changes to environment

The majority of participants discussed making changes to the learning environment as a common intervention used to support children with ASC experiencing unusual sensory responses. These changes ranged from reducing sensory stimulation by setting up an individual work area to changing physical features in the classroom, such as the lighting.

“Some nurseries are moving towards kind of using a more, a bay approach, where it cuts down the visual stimuli” (EP1)

“And you know, for them, sometimes it is giving them… It’s sometimes about the environment, so actually, we need to change the environment” (ST1)

“You know, looking at the classroom environment, what things could be done that would make things a little bit easier for that child” (OT1)

“The range of interventions that we use are, first of all have a look at…do an audit, see what you can change, see what you can reduce” (ST2)

“I’ve worked in a number of schools, where they’ve adapted their entire sort of structure of the school, and others will place areas within a classroom, away from these wretched strip lighting and an area, which is a more sort of peaceful area” (EP2)

Table 4.36 Quotes evidencing Subtheme 2: Changes to environment.
4.3.1.2.3 Subtheme 3: Sensory retreats

Creating a sensory retreat or quiet zone was discussed by many participants as an intervention used in schools to support children with ASC experiencing unusual sensory responses.

“So if the child had issues around noise, they’d be thinking about where to sit them, about if the noise did get too… the levels did get too high, what the child could do. So they had the option to go and seek some quiet time somewhere” (EP1)

“My advice would be to, sort of, have movement breaks or a sensory retreat that they could go to somewhere, you know, like the corner of the library where it’s quiet and if they feel like they need a break” (OT2)

“We talk about using safe spaces, so can you create somewhere in your room, in your school or in your room that’s a bit quieter” (ST2)

Table 4.37 Quotes evidencing Subtheme 3: Sensory retreats.

4.3.1.2.4 Subtheme 4: Accommodations

A number of participants had experienced school staff making certain accommodations for children with ASC experiencing unusual sensory responses, such as preparing children for changes in their sensory environment, allowing children to avoid situations likely to result in sensory overload and engineering additional informal opportunities for the child’s sensory needs to be met.

“Warning the child when it’s going to be…when they’re going to start singing a hymn or when the music’s going to start, those kind of things” (ST2)

“Accepting that they don’t actually have to be in there, because being in that noisy environment is going to make the rest of the day so stressful for them, that actually it’s better if they have their lunch early with a small group, or with a different…you know, in a different sort of area with a smaller group of
"It is quite nice when they get to an age or a stage where you can give an opportunity and use a time out card, or ask them to, you know, have a signal that says, actually, I need to move now, so that they begin to recognise that they can self-manage, really" (ST2)

Table 4.39 Quotes evidencing Subtheme 5: Psycho education.
4.3.2 Organising theme 2: Differences between special and mainstream

Within the interviews a number of participants discussed the differences they had experienced in supporting the sensory needs of children with ASC between mainstream and special educational settings. Three basic themes were identified relating to these differences: understanding, ethos and provision. The organising theme of ‘differences between special and mainstream’ therefore arose from the three basic themes.

4.3.2.1 Basic theme 1: Understanding

One participant voiced that in their experience they felt that mainstream schools did not have a good understanding of unusual sensory responses experienced by children with ASC.

“I don't get the impression that our mainstream schools are that aware yet” (EP1)

Table 4.40 Quote evidencing Basic theme 1: Understanding.
4.3.2.2 Basic theme 2: Ethos

One participant felt that there were sometimes differences in ethos between mainstream and special education settings with regards to supporting the unusual sensory responses of children with ASC

“To be honest, more in special schools, they seem to be more keen or willing to think outside the procedures than mainstreams” (EP2)

“Within special schools, but I kind of, sort of instinctive, organisational culture as well, that's kind of unspoken and picked up within that environment. As I say, you don't necessarily get that in mainstream schools” (EP2)

Table 4.41 Quotes evidencing Basic theme 2: Ethos.

4.3.2.3 Basic theme 3: Provision

A number of participants felt that there were differences between mainstream and special schools with regards to the provision available for supporting unusual sensory responses in children with ASC and access to specialist support.

“And one of the big things I think, for mainstream schools, is having space. You know, if it’s somebody who needs a quiet area at time, you often find the schools saying, that's not available, you know, and it's a matter of debate whether it is, or whether it's being used for something else” (ST1)

“And I... you know, I just don't think, in mainstream schools, they get any access to OT support at all. I'm sure, round certain individuals, OTs may visit, but that doesn't cover everything” (ST1)

“In a special school environment, they have fantastic sensory rooms. In mainstream schools, which is where we work, those spaces and places aren't available” (ST2)

Table 4.42 Quotes evidencing Basic theme 3: Provision.
4.3.3 Organising theme 3: Efficacy

Within the interviews a number of participants discussed issues regarding the complex nature of supporting sensory needs, fidelity of interventions delivered in school and developing evidence base of intervention. Therefore, three basic themes were identified: multiple interacting factors, fidelity and developing evidence base. These basic themes gave rise to the organising theme termed ‘efficacy’.

4.3.3.1 Basic theme 1: Multiple interacting factors

A number of participants reflected on the complexities involved in supporting unusual sensory responses in children with ASC due to the individual nature of response to intervention. Participants voiced that these multiple interacting factors had made it difficult for them to predict which intervention strategies would work for individual children, which had sometimes led to a trial and error approach being used, rather than evidence based decisions.

“I mean, it’s been very individual to the young person” (ST1)

“You could give them a list of activities and not all of them would work as well as others. So I said, try them all and see what seems to work the best and build it
Table 4.43 Quotes evidencing Basic theme 1: Multiple interacting factors.

4.3.3.2 Basic theme 2: Fidelity

One participant raised concerns regarding the fidelity of interventions aimed at supporting unusual sensory responses in children with ASC. In particular, these concerns were raised with regards to the planning and delivery of sensory activities within the curriculum and the appropriateness of use of the school’s sensory room.

“I think it’s [sensory activities] something that needs a lot more work, because people will say, we’re doing some sensory work, and sometimes that is just having some furry things out, or some flashy toys, or things like that. So it does need some work” (ST1)

“I think that’s used [sensory room], you know, sometimes it’s used very well, sometimes it’s used as a bit of a, sort of, a, you know, a nice time and a bit of a chill out space, not necessarily for sensory input” (ST1)

Table 4.44 Quotes evidencing Basic theme 2: Fidelity.

4.3.3.3 Basic theme 3: Developing evidence base

One participant reflected on the developing nature of the evidence base for supporting unusual sensory responses experience by children with ASC, specifically interventions based on sensory integration theory.

“Well, there’s all the sensory integration literature, which there's masses of, although there's not a great deal of proper evidence to support it” (OT2)

Table 4.45 Quote evidencing Basic theme 3: Developing evidence base.
4.3.4 Summary of findings for Research Question 2

What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?

The data from the interviews yielded three organising themes for RQ2, with each organising theme arising from a number of basic themes and subthemes (see Figure 4.3).

Organising themes for RQ2:
- Interventions
- Differences between special and mainstream
- Efficacy

Within the interviews a number of interventions for supporting children with ASC experiencing unusual sensory responses were described by participants. A number of participants discussed interventions aimed at remediating unusual responses to sensory stimuli in children with ASC, such as the use of specialist equipment, sensory diets, sensory rooms, sensory integration based activities and gradual desensitisation. The use of interventions aimed at managing the unusual sensory responses experienced by children with ASC in educational settings were also discussed, such as using specialist equipment, making changes to the learning environment, creating a sensory retreat or quiet zone, preparing children for changes in their sensory environment, allowing children to avoid situations likely to result in sensory overload, and increasing children’s awareness and self management of their sensory needs in the classroom.

The differences participants had experienced in supporting the sensory needs of children with ASC between mainstream and special educational settings were also highlighted. These included mainstream schools not having as good an
understanding of the sensory needs of children with ASC, differences in ethos and differences in provision and access to specialist support.

A number of participants also identified issues regarding the efficacy of interventions aimed at supporting children with ASC experiencing unusual sensory responses. Participants discussed the individual nature of children’s responses to intervention and hypothesised that this could be due to the multiple interacting factors involved when children experience unusual sensory responses. This had made it difficult for participants to predict which intervention strategies would work for which children, leading to a trial and error approach to intervention, rather than evidence based practice. In addition, concerns were raised regarding the fidelity of use of those interventions that were based on research literature, such as sensory integration based activities and sensory rooms. Participants also reflected on the developing nature of the evidence base for interventions aimed at remediating unusual sensory responses experienced by children with ASC, such as sensory integration therapy.

4.4 Research Question 3

What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?

As seen in figure 4.4, the data from the interviews yielded two organising themes for RQ3. RQ3 will be answered by discussing each organising theme and its associated basic and subthemes separately.
Figure 4.4 Thematic map for RQ3.
4.4.1 Organising theme 1: Barriers

A number of subthemes were identified by the present author regarding participants' perceptions of factors that hindered the support given to children with ASC experiencing unusual sensory responses in educational settings. These subthemes gave rise to five basic themes: lack of access to external support, school factors, logistics, staff characteristics, and organisational factors. These basic themes then yielded the organising theme that was termed ‘barriers’
4.4.1.1 Basic theme 1: Lack of access to external support

One participant discussed the difficulties she had experienced as a specialist teacher accessing support from the NHS Occupational Therapy (OT) service. This had led the setting where she worked to buy in independent OT services.

“...it’s very, very difficult to get OT input. I mean, obviously, we’ve bought some in now. Before that, it was almost impossible...but I know it’s still very, very difficult to access that, you know, it’s got to be done in a particular way, and there are waiting lists” (ST1)

Table 4.46 Quote evidencing Basic theme 1: Lack of access to external support.

4.4.1.2 Basic theme 2: School factors

A number of participants discussed the barriers they had experienced in terms of factors relating to the whole school system.

4.4.1.2.1 Subtheme 1: School culture

A school’s culture and ethos were reported by many participants to be potential barriers for supporting unusual sensory responses in children with ASC. In particular, barriers were discussed in terms of a lack of flexibility at a whole school level for supporting individual needs and reluctance to release funding for purchasing resources for individual needs.

“It depends how flexible the school is as well, doesn’t it?” (EP1)

“I think sometimes it can be really difficult to try and get any money out of the school as well...some schools are like, yes, yes, we’ll buy it. That’s no problem. You know, they’re only £25 but then others are like, no, there’s no money and that’s just the end of the conversation” (OT2)
Table 4.47 Quotes evidencing Subtheme 1: School culture.

4.4.1.2.2 Subtheme 2: Competing priorities

Many participants discussed competing priorities, at a whole school level as well as at an individual level, as a barrier for supporting children with ASC experiencing unusual sensory responses.

| “But I think teachers are so busy, sometimes” (EP1) |
| “And also, it being within the school, a priority, you know, where people might think you’re a little bit mad, and other teachers might think you’re a little bit mad, and you know, if your senior staff don’t see that as a priority, because priorities, you know, that’s another issue, isn’t it?” (ST1) |
| “Probably a lot of that is to do with class sizes, pressure, how many other children may be in that classroom” (OT1) |
| “You know, there are so many demands on the teachers and the children in the school, you know, sort of, academically and socially and then to have something else to do as well, that’s a big factor” (OT2) |

Table 4.48 Quotes evidencing Subtheme 2: Competing priorities.

4.4.1.2.3 Subtheme 3: Curriculum factors

A number of factors related to the curriculum were perceived to present barriers to supporting the sensory needs of children with ASC. These factors included the constraining nature of the curriculum, the pressure to include curriculum content within sensory activities and the high level of stimulation during curriculum delivery.

| “The constraints of the curriculum as well. You know, schools find it quite hard to be flexible, don’t they, sometimes” (EP1) |
| “We have had sensory, sort of, afternoons, where teachers have taken particular activities, but they kind of morph, you know, as we’re teachers, |

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aren't we, you know, they morph into more educational activities, really, you know, so although they start off with a sensory, sort of, you know, so there may be water play, or there may be clay, or there may... you know, it tends to have another need, as well" (ST1)

“What teachers and educators are quite often asked to do is to provide an all-singing, all-dancing, high stimulus entertaining environment for all the children, because they’ll learn better, and all of those things are exactly what will impede a child with sensory difficulties” (ST2)

Table 4.49 Quotes evidencing Subtheme 3: Curriculum factors.

4.4.1.2.4 Subtheme 4: Lack of communication between staff

Lack of communication between individual members of staff in school was reported to be a barrier to supporting the unusual sensory responses of children with ASC in educational settings.

“Dinner ladies and things like that as well because they often look after them at lunchtime and sometimes the information doesn't get passed to them so they're not as understanding as they, perhaps, should be” (OT2)

Table 4.50 Quote evidencing Subtheme 4: Lack of communication between staff.

4.4.1.3 Basic theme 3: Logistics

There were a number of barriers that were discussed by participants regarding the logistics of supporting the sensory needs of children with ASC within educational settings.
4.4.1.3.1 Subtheme 1: Staffing

Many of the participants felt that a lack of staffing was a barrier to the implementation of interventions in school to support the sensory needs of children with ASC. Alongside this, participants also commented on schools' lack of flexibility regarding staffing as another barrier to intervention. In addition, one participant voiced concerns regarding recent discussions within the Government regarding potential changes to paraprofessional support in schools.

<table>
<thead>
<tr>
<th>Quote</th>
<th>Source</th>
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<tbody>
<tr>
<td>“Generally speaking, we're a high achieving authority, so we are quite a poor authority in terms of money per head of child. So our schools tend not to be very well staffed”</td>
<td>(EP1)</td>
</tr>
<tr>
<td>“I think a difficult thing comes if a child doesn't have an SSA assigned to them specifically, you know, if they haven’t got a statement or the statement doesn't give them, you know, kind of, an abundance of SSA hours”</td>
<td>(OT2)</td>
</tr>
<tr>
<td>“Some schools are brilliant, they really flexible. You know, they’ll find a teacher's assistant who will do it with them but then others will just be, no we can’t do it. We haven’t got the staff”</td>
<td>(OT2)</td>
</tr>
<tr>
<td>“I'm concerned, one of the barriers is, I think they're trying to remove, or to reduce reliance on teaching assistants, and whilst I think that is the right way to go, because I've found that sometimes our children can get very dependent on that one person, and whilst they need the continuity and the support of one person, that one person then can shield them from too many things, or they can become too reliant. So that, whilst it can…it’s a double-edged sword, because it can be a real benefit, but at the same time, it can also cause a bit of a difficulty, but it does worry me that they are taking that sort of support, that one to one support, I'm not saying it's being taken away, but they’re looking at how they use support staff more flexibly”</td>
<td>(ST2)</td>
</tr>
</tbody>
</table>

Table 4.51 Quotes evidencing Subtheme 1: Staffing.
4.4.1.3.2 Subtheme 2: Space

A lack of physical space within schools to implement sensory interventions was raised as a logistical barrier to support children experiencing unusual sensory responses by many participants.

“But I think if you can change the geography of the room, then that’s going to be effective too, but it isn’t always possible in some of our older schools” (EP1)

“I mean, even space is another difficult issue in school when you’re maybe wanting... even if you do have an SSA, if you’re wanting maybe that child to be taken out regularly to do whatever, if there isn’t the facilities, the space within the school to do that, that’s often difficult” (OT1)

“I suppose like I said space is a big thing and I suppose, like, the space and, sort of, the environment, you know, the buildings. Lots of schools are, kind of, a hotchpotch of add-ons and, you know, portacabins and things like that. You know, that has an impact” (OT2)

“I think we’re hindered to a great degree in the settings in which I work, by the physical spaces in which we work. So there are very few small withdrawal rooms, there are very few rooms with nice carpets and appropriate lighting. So we’re really constrained by the physical environment” (ST2)

Table 4.52 Quotes evidencing Subtheme 2: Space.

4.4.1.3.3 Subtheme 3: Time

Time constraints in schools were voiced by many participants as a barrier to the implementation of interventions to support the sensory needs of children with ASC.

“There’s also the time, the time factor, as well, you know, and I know that’s easy to say. And often, one of the things that we do say to staff is, well,
you’re having to spend time with them because they’ve become distressed, you might as well spend time with them, you know, swinging them in blanket. But, and however, you know, it is difficult to find the time” (ST1)

“I think, time, actually. I think, a lack of time, and I think, a lack of time to work on those sensory… Either, more probably, to give them the sensory stimulus that they need, so for example, a child that needs to get out and run very frequently, who isn’t able to get out and run because of, you know, the amount of time, the amount of curriculum pressure, the amount of all the other things that they need to do” (ST2)

Table 4.53 Quotes evidencing Subtheme 3: Time.

4.4.1.3.4 Subtheme 4: Resources

A lack of resourced provision in school, for example a sensory room or retreat, was discussed as a barrier to supporting the sensory needs of children with ASC. In addition, one participant, who was an OT, discussed the physical barriers she would experience, regarding the transportation of resources and equipment, if she was to deliver direct therapy within a school setting.

“Well, a couple of our schools, I think, have... they haven’t got formal sensory rooms, but they’ve perhaps had a room that’s quieter, where they’ve had perhaps a ball pool. So again, they’ve accommodated, but not specific sensory rooms, no” (EP1)

“But as a post, I think it would just be too difficult; one, you’d have to take all the equipment with you – I don’t know how you’d get that into a school, unless it was maybe a special school and they already had everything there; you know, and I think it would be quite time-consuming, getting everything in your car, bringing... you know, getting everything ready, getting your car, putting everything in, going to the school, parking up, if you can, in the school car-park, get... I think that would just be... it would be too difficult” (OT1)
Table 4.54 Quotes evidencing Subtheme 4: Resources.

4.4.1.4 Basic theme 4: Staff characteristics

There were a number of staff characteristics that participants felt presented barriers to supporting children with ASC experiencing unusual sensory responses in an educational setting.

4.4.1.4.1 Subtheme 1: Attitude

The attitude of some members of school staff towards children experiencing unusual sensory responses was highlighted as a potential barrier to supporting their sensory needs in school. In particular, this was characterised as a lack of flexibility, unwillingness to try something new, lack of enthusiasm, pessimistic approach to intervention, perception that supporting sensory needs does not fall into their professional role and reluctance to take sensory needs seriously.

“A lack of flexibility, a determination that you do it my way because that’s the only way there is to do it” (ST2)

“You know, it’s personalities, isn’t it? Some people are very open, will try anything: brilliant, anything you suggest, we’ll give it a go; and then others aren’t so” (OT2)

“Yes, I suppose things like the enthusiasm of the staff, you know, if they, kind of, think oh, well, it’s just a load of mumbo jumbo. I’m not doing that. What a waste of time” (OT2)

“And they may be aware that, say, loud noises are a problem, but are, sort of, well, you know, there’s nothing we can do about it” (ST1)

“Again the biggest one is probably ‘not my job’, it’s somebody else’s job” (EP2)

“I’ll wonder if they’ve actually taken that seriously, because actually convincing somebody that doesn’t have any sensory needs that another
person does have sensory needs is really difficult” (ST2)

Table 4.55 Quotes evidencing Subtheme 1: Attitude.

4.4.1.4.2 Subtheme 2: Lack of understanding

A lack of understanding from the members of staff supporting children with ASC experiencing unusual sensory responses was also raised as a barrier to supporting these needs in school.

“But I don’t think, generally, the understanding is there of the sensory needs, no” (ST1)

“And I just think maybe the understanding of the people that are working with the children, because I think at one level it can sound like a right load of mumbo-jumbo, you know” (OT1)

“I think what really creates a barrier is this one size fits all approach” (ST2)

Table 4.56 Quotes evidencing Subtheme 2: Lack of understanding.

4.4.1.4.3 Subtheme 3: Perception of need

Many participants felt that a barrier to supporting the sensory needs of children with ASC was the perception of some members of school staff that unusual sensory responses represented a behavioural issue, with the child purposely choosing to be disruptive. Linked with this was participants’ view that some members of staff struggle to view sensory needs from the child’s perspective and therefore will question the legitimacy of these responses.

“I think the perception is of her that she’s just opting out of things, and even within our setting, where we’re a specialist setting” (ST1)

“It’s sometimes a bit of a battle to get people to believe that, actually, there’s a sensory issue going there, and not a behavioural issue” (ST1)

“A person who finds it very difficult to get away from the idea that the child is
Table 4.57 Quotes evidencing Subtheme 3: Perception of need.

4.4.1.5 Basic theme 5: Organisational factors

There were a number of barriers that were discussed by participants regarding the organisational factors, beyond those at a school level, linked with supporting the sensory needs of children with ASC within educational settings.

4.4.1.5.1 Subtheme 1: Pathways

One participant felt that a particular organisational barrier within their Local Authority (LA) was the lack of a dedicated pathway for supporting children’s sensory needs generally as well as the lack of an OT on the diagnostic pathway team for supporting sensory needs specifically for children with ASC.

“And also if I think about things like the pathways, so in [LA1] where I worked before, there was an OT on the pathway, but never at [LA2] there wasn’t, and there isn’t here” (EP2)

Table 4.58 Quote evidencing Subtheme 1: Pathways.

4.4.1.5.2 Subtheme 2: Local Authority priorities

One participant voiced that due to funding cuts in their LA, supporting the sensory needs of children with ASC in educational settings might not be a priority within the LA.
“And in the current climate, with cuts being made left, right and centre, trying to devise something new, both for health and education, is not high on their list of priorities” (EP1)

Table 4.59 Quote evidencing Subtheme 2: Local Authority priorities.

4.4.1.5.3 Subtheme 3: Models of service delivery

Many participants reported constraints with regards to their professional models of service delivery and supporting the sensory needs of children with ASC. This particularly focused on the role of the OT, with participants voicing that OTs were limited in their capacity to deliver direct interventions for sensory needs and follow up children in school subsequent to providing initial advice. Changing models of service delivery were also raised as potential barriers, both in terms of traded services (i.e. schools making the decisions regarding the nature of support being commissioned) and top down management of delivery models (senior NHS managers placing restrictions on OTs working in educational settings). However, barriers in service delivery were also discussed with regards to the specialist teacher profession, for example large caseloads and lack of staffing to provide on the ground, practical support in the classroom.

“But certainly education is in discussion with our OTs about, because they have the skills, they’re not commissioned to provide them at the moment. So they give general advice but they don’t follow up. Whereas we want that follow up and we want that sensory diet to be commissioned and put in place” (EP1)

“I suppose, because we’re more of an assessment and advice service then that would be a constraint. You know, I suppose, in an ideal world it would be good to offer a bit more treatment and to develop that side of the service” (OT2)

“Yes. It’s... I think at the moment things are changing so much, it’s what schools are prepared to buy, isn’t it?” (EP1)
“Apparently the [body of senior NHS managers] are going to be a bit more specific about what they're, kind of, willing to, and not, pay for so whether that might change a bit I’m not sure....I think probably at some point they’re going to specify exactly what we can do, how many times we can see a child. I anticipate that is what will happen. So that will obviously have a big impact on what we can do. I mean I suppose the other thing is that the education authorities don’t pay for any of our posts or any of our time” (OT2)

“We have a large caseload, and there are four of us, so our time with schools is very limited. There are 450-odd children identified in the borough, and there’s myself, specialist teacher, and then we have three teaching assistants, so as you can imagine, that means that we don’t get lots of time” (ST2)

“For example, I’ve had a phone call this morning, we’ve got a new boy gone into his reception class, and they’re already having quite significant challenges, he’s in a mainstream classroom, but he only wants to watch Thomas DVD and play with his Thomas train, and I think part of that is because this whole sensory experience will be way too much for him, and what I would really like to do is to be able to say, right, we’re going to put a specialist in for the next three days, the next week, the next two weeks so that he’s constantly got somebody there who knows what they’re doing, who can say, can you not see this? You know, this is the sign, you can tell, he’s rocking, he’s pacing, he’s chewing, he’s becoming more agitated. How can you address that? How can...what can we do to enable him? So I think our constraint is people” (ST1)

Table 4.60 Quotes evidencing Subtheme 3: Models of service delivery.
4.4.2 Organising theme 2: Facilitators

A number of subthemes were identified by the present author regarding participants’ perceptions of factors that aided the support given to children with ASC experiencing unusual sensory responses in educational settings. These subthemes gave rise to six basic themes: access to external support, parental support, school factors, logistics, staff characteristics, and organisational factors.
These basic themes then yielded the organising theme that was termed ‘facilitators’.

4.4.2.1 Basic theme 1: Access to external support

One participant felt that access to external support, in particular from OTs, was a facilitator in supporting the sensory needs of children with ASC in educational settings.

“I think, where it’s easiest is where there’s OT input, because I think that as teachers, we tend to look to that as being the expert input” (ST1)

“You can’t just go, well, I think we’ll use some weighted blankets, I think that’d be… Because actually, you know, my feeling is that you could probably do some damage with intervening that… I don’t know how much damage you could do, or…but I’d be very wary of putting in place, sort of, quite a…you know, other than in the terms of a play, and in terms of experiential thing, I’d be very wary of putting in place a programme unless I’d had that professional advice really” (ST1)

“So yes, something that’s easily accessible, I think, in terms of professional input would be really helpful” (ST1)

Table 4.61 Quotes evidencing Basic theme 1: Access to external support.

4.4.2.2 Basic theme 2: Parental support

The support and cooperation of parents with regards to sensory needs was identified as a facilitator to supporting these needs within an educational setting. This was discussed at an individual level, meaning the support of parents with regards to one child, but also at a group level, meaning parental organisations set up to lobby for the sensory needs of children with ASC in educational settings.

“I think school and home go hand in hand, don’t they? If you can help and get
everybody onboard, then I think, you know… it’s like the behaviour strategy, I suppose. You all need to be adopting the same thing, don’t you” (OT1)

“I think, like, motivated parents as well who are going to pass on information to the school and be involved in meetings and things like that, helps” (OT2)

“There’s a strong sort of parent group, pressure group, whatever we wanna call it, that want sensory assessments for kids within the authority” (EP2)

Table 4.62 Quotes evidencing Basic theme 2: Parental support.

4.4.2.3 Basic theme 3: School factors

A number of whole school factors were reported by participants to facilitate the support children with ASC experiencing unusual sensory responses.

4.4.2.3.1 Subtheme 1: School culture

An accommodating and understanding organisational culture and whole school approach to supporting the sensory needs of children with ASC were voiced as facilitators.

“You know, there are some mainstream schools that, you know, that I’ve experienced that are quite tuned in” (ST1)

“I think, kind of, probably like a whole school response really to the child’s needs. You know, you could have a great teacher one year who, kind of, you know, makes a classroom not too visually stimulating, not too busy and, you know, is very clear about the routine and everything and then they could go into the next classroom with a different teacher and it could be completely different. So I think, I suppose, the cooperation of the staff in the school” (OT2)

“And I suppose if that’s [culture of support] embedded into the organisational culture, throughout that then that’s likely to have the most longstanding effect” (EP2)
Table 4.63 Quotes evidencing Subtheme 1: School culture.

4.4.2.3.2 Subtheme 2: School buildings

New school buildings that incorporate withdrawal rooms and places for quiet retreat were discussed as a facilitator to supporting the sensory needs of children with ASC.

“I think, some of the modern…the new builds that I’ve seen in schools has facilitated, because I think there’s more of a recognition that, actually, small spaces within schools are…make schools more flexible, rather than just massive classrooms” (ST2)

Table 4.64 Quote evidencing Subtheme 2: School buildings.

4.4.2.4 Basic theme 4: Logistics

A number of logistical facilitators were raised by participants as supporting the sensory needs of children with ASC.

4.4.2.4.1 Subtheme 1: Space

A school with the space available to withdraw children for sensory activities or act as a sensory retreat for children was reported to be a facilitator.

“Also a school with some space and some quiet space to do things with the child, that helps” (OT2)

Table 4.65 Quote evidencing Subtheme 1: Space.

4.4.2.4.2 Subtheme 2: Staffing
A number of participants reported that having a member of support staff available acted as a facilitator for supporting the sensory needs of children with ASC.

| “[child] had a statement, so luckily had someone that could work with him” (OT1) |
| “I think having the staff to carry out the interventions, isn’t it? I think where it’s worked, it’s... that’s been a big factor” (OT1) |
| “I think it does help if they’ve got a person, an SSA, or a teaching assistant who does the majority of their work with them. It does help with consistency” (OT2) |

Table 4.66 Quotes evidencing Subtheme 2: Staffing.

4.4.2.4.3 Subtheme 3: Resources

Many participants identified having the appropriate resources and provision available was a facilitator for supporting children with ASC experiencing unusual sensory responses.

| “The other thing I think is resources. It is something that needs resource. You know, it’s no good saying, no, well, we’ll get by without, you know, if there are particular things that are needed, they’re needed” (ST1) |
| “Most decent special schools will have a sensory room. Most of them will have trampoline facilities, most of them will have swimming pools or hydra pools, and so they, and that’s not because of the ASC it’s because they know that works for kids who have difficulties with sensory difficulties” (EP2) |
| “I suppose it’s then having the resources available. But ultimately, those can get bought if there is that spirit of understanding” (EP2) |

Table 4.67 Quotes evidencing Subtheme 3: Resources.

4.4.2.5 Basic theme 5: Staff characteristics
A number of facilitators related to the characteristics of members of school staff were discussed by participants.

4.4.2.5.1 Subtheme 1: Flexibility

A number of participants felt that members of school staff need to be flexible in their approach to teaching and supporting children with ASC and sensory needs.

“I think staff that are willing to be flexible. Those staff that are open to trying something. That’s the key thing really. Somebody who’s willing to have a go as much as anything” (EP1)

“A flexible approach by the staff as well” (OT2)

Table 4.68 Quotes evidencing Subtheme 1: Flexibility.

4.4.2.5.2 Subtheme 2: Attitude

A positive attitude from school staff towards the sensory needs of children with ASC was identified as a facilitator for supporting these needs in school.

“I think if you’ve got, sort of, a proactive SENCO as well, that helps a lot; you know, who’s, sort of, interested and motivated. I think that helps” (OT2)

“Staff awareness, staff acceptance, staff flexibility. And staff, sort of, thinking outside the box. I think a lot of what helps, what facilitates, is the…is the sort of staff attitudes and opinions” (ST2)

Table 4.69 Quotes evidencing Subtheme 2: Attitude.

4.4.2.5.3 Subtheme 3: Skill level
A number of participants highlighted school staff having knowledge, understanding and awareness of the sensory needs of children with ASC as a facilitator to supporting these needs in an educational setting.

| “And then it comes down to skill, knowledge and awareness” (EP1) |
| “I think the number one is staff knowing about and being able to recognise. I mean, that’s the number one. Without that, it’s very difficult. You know, they need to recognise that there’s a sensory need there, and they need to have some awareness, and probably some training there” (ST1) |
| “So I think the biggest facilitator is an understanding that it’s important and that it’s a valuable thing to be considering” (EP2) |

Table 4.70 Quotes evidencing Subtheme 3: Skill level.

4.4.2.6 Basic theme 6: Organisational factors

A number of organisational factors, beyond those at a school level, were discussed as facilitating support for children with ASC experiencing unusual sensory responses.

4.4.2.6.1 Subtheme 1: Statementing process

One participant felt that changes to the way in which Statements of Special Educational Need (SEN) were written would facilitate the support of sensory needs for children with ASC.

| “Interviewer: And have any of the children that you’ve come across had access to sensory activities, like, built into their curriculum at all? Perhaps not a sensory room or sort of...
  Participant 1: Beginning to look at that, schools are beginning to look at that. And we’re beginning to write that into statements as well” (EP1) |

Table 4.71 Quote evidencing Subtheme 1: Statementing process.
4.4.2.6.2 Subtheme 2: Service delivery models

A number of aspects related to models of service delivery were proposed as facilitators to supporting the sensory needs of children with ASC in educational settings. The growth in traded services was voiced to have improved access to OT support for educational settings. One participant, who was an OT, also voiced that a high level of flexibility regarding how often she works with individual children was a facilitator to supporting their sensory needs. A number of facilitators regarding service delivery models not currently in existence were also proposed by participants, such as dedicated school OTs, NHS OTs spending more time in education settings following the introduction of Education, Health and Care (EHC) plans and the inclusion of practical support, as well as assessment and advice, into external professionals’ roles.

| “We are seeing more specialist OTs being commissioned, both by the local authority and by certainly our special school” (EP1) |
| “Because of the situation we’ve been in [lack of access to OT support], that we did buy some time in” (ST1) |
| “There’s no, sort of, constraints to where we can see them and if we need to see them a few times, you know, if they weren’t particularly cooperative then, you know, we could see them here, see them at home, see them initially at school” (OT2) |
| “You know, it would be great if you could have some OT available that’s sort of dedicated to schools, really, because it [sensory needs] does seem to be one of the things that causes the most difficulties, and yet, it’s the, sort of, least known about, really” (ST1) |
| “If we get the health, care and education plans which are coming up, if they work together really well, one of the things I’d like, changes I’d like to see is” |
“Actually occupational therapists working within schools and educators talking to occupational therapists about sensory difficulties” (ST2)

“Maybe seeing it in practice would kind of get people on board a little bit more as well there” (OT2)

Table 4.72 Quotes evidencing Subtheme 2: Service delivery models.

4.4.2.6.3 Subtheme 3: Diagnostic factors

Changes to the diagnostic criteria of ASC following the publication of the new Diagnostic and Statistical Manual (DSM-V) were voiced as a facilitator to supporting the sensory needs of children with ASC in educational settings due to raised awareness and references to these needs within diagnostic reports.

“I think everyone’s just more aware of the… that, you know, I think since the diagnostic criteria changed and all the sensory, you know, part of an autistic specialist… the sensory difficulties have been acknowledged” (OT1)

“And I think the diagnostic, sort of, criteria are starting to include those sensory difficulties” (ST2)

Table 4.73 Quotes evidencing Subtheme 3: Diagnostic factors.

4.4.2.6.4 Subtheme 4: Supportive management

Participants in both the OT and EP professions voiced that the support of senior managers both within their individual services and LA was a facilitator to supporting the sensory needs of children with ASC.

“I think the support of the, sort of, the [senior manager] here has helped because they’ve been quite supportive and quite interested and enthusiastic about it. So that’s helped” (OT2)

“And it is something that’s on our development plan for the authority” (EP2)
“My boss, the principal psychologist is the lead professional in developing this sort of sensory assessment across the city. So it’s the same in that further level of working within the local authority, is a sense that within the local authority there is an organisation and culture that understands that this is an issue, a long term issue for kids on, with ASC, and that that needs to be then managed in a systematic, sensible, coherent, strategic plan” (EP2)

Table 4.74 Quotes evidencing Subtheme 4: Supportive management.

4.4.3 Summary of findings for Research Question 3

What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?

The data from the interviews yielded two organising themes for RQ3, with each organising theme arising from a number of basic themes and subthemes (see Figure 4.4).

Organising themes for RQ3:

- Barriers
- Facilitators

Within the interviews a number of barriers, perceived by participants to hinder the support given to children with ASC experiencing unusual sensory responses in educational settings, were discussed. It was reported that difficulties accessing external support had led some schools to buy in independent occupational therapy services. Whole school barriers to supporting the sensory needs of children with ASC were also identified, such as a lack of flexibility at a whole school level for supporting individual needs, reluctance to release funding for purchasing resources, competing priorities, curriculum constraints and lack of communication between staff. Participants raised a number of logistical barriers to supporting the unusual sensory responses of children with ASC within school, such as a lack of staffing, lack of physical space to implement sensory
interventions, time constraints and a lack of resources and provision. In addition, there were a number of staff characteristics that participants felt presented barriers to supporting children with ASC experiencing unusual sensory responses in an educational setting. These personal attributes included a lack of flexibility, unwillingness to try something new, lack of enthusiasm, pessimistic approach to intervention, perception that supporting sensory needs does not fall into their role, reluctance to take sensory needs seriously, lack of understanding and belief that these children are purposely choosing to be disruptive. Many participants also discussed organisational barriers, beyond those at a school level, linked with supporting the sensory needs of children with ASC within educational settings. These included the lack of dedicated Local Authority (LA) pathways for supporting children’s sensory needs, lack of OTs on the diagnostic pathway teams for ASC, LA and NHS funding cuts and constraints regarding models of service delivery.

Within the interviews a number of facilitators, perceived by participants to aid the support given to children with ASC experiencing unusual sensory responses in educational settings, were discussed. Access to external support and the support and cooperation of parents were identified as facilitators to supporting sensory needs within an educational setting. A number of school factors were also identified, such as an accommodating and understanding organisational culture, whole school approach to support and new school buildings. Logistical facilitators to supporting sensory needs included having the space available to withdraw children for sensory activities or act as a sensory retreat, flexible staffing, and appropriate resources and provision. A number of facilitators related to the characteristics of members of school staff were also discussed by participants. Participants felt that members of school staff needed to be flexible in their approach to teaching and supporting children with ASC and sensory needs, have a positive attitude and have knowledge, understanding and awareness of the sensory needs of children with ASC. In addition, a number of organisational factors, beyond those at a school level, were discussed as facilitating support for children with ASC experiencing unusual sensory responses, such as changes to the way in which Statements of SEN were written, models of service delivery, and diagnostic criteria of ASC. The recognition of the sensory needs of children
with ASC from senior managers within the LA and NHS was also highlighted as an organisational facilitator.

4.5 Executive summary

Interview data were amalgamated into one data set and analysed using thematic analysis (Braun & Clarke, 2006). The findings were presented according to the present study’s research questions (RQs) and a thematic map created for each RQ (see Figures 4.2, 4.3 and 4.4). A hierarchical system of themes was used meaning that initial codes were organised into ‘subthemes’, subthemes organised into ‘basic’ themes, and basic themes arranged into overarching concepts, termed ‘organising’ themes (see Figure 4.1). The data from the interviews yielded six organising themes for RQ1: conceptualisations, assessment, defining unusual sensory responses, pragmatism, impact at school and professionals’ roles. Three organising themes arose from the data for RQ2: interventions, differences between special and mainstream, and efficacy. The data from the interviews yielded two organising themes for RQ3: barriers and facilitators. The following chapter will discuss these findings in relation to the literature discussed in Chapter 2, identify areas for further research and explore the implications of such findings on professional practice.
Chapter 5

Discussion

5.1 Overview of chapter

This chapter provides a discussion of the findings from the present research study. The aim of the study was to gather and qualitatively analyse professionals' experiences with regards to the unusual sensory responses demonstrated by children with ASC in educational settings. The research had three Research Questions (RQ):

1. What experiences and conceptualisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?

2. What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?

3. What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?

An exploratory single-embedded case study design was used to explore these RQs with two Specialist Teachers, two Specialist Educational Psychologists and two Occupational Therapists. Data were gathered through individual semi-structured interviews with each participant, resulting in six interviews. Data were analysed using thematic analysis (Braun & Clarke, 2006) and thematic maps created for each RQ.

This chapter begins by providing a brief overview of existing literature in this area, culminating in the presentation of identified gaps in the literature, as discussed in Chapter. A summary of the present study’s findings is then given, which is followed
by a discussion of the theoretical implications of the findings, reflecting on how they fit within and contribute to existing literature in this area. Following this, the present author’s reflections on the implications of the present study’s findings on professional practice are presented. The chapter concludes with a discussion of the limitations of the present research and recommendations for further research.

5.2 Overview of existing literature

5.2.1 Conceptualising unusual sensory responses in children with ASC

There are a number of conceptual models that have been put forward to explain the phenomenon of unusual responses to sensory stimuli. These models include Dunn’s (1997) model of sensory processing, Ayres’ (1972) theory of sensory integration (SI) and Miller et al’s (2007) SI-based classification system. A number of conceptualisations of unusual sensory responses have also been put forward specifically for individuals with ASC, such as Delacato’s (1974) sensory patterns and Bogdashina’s (2003) sensory-perceptual descriptors. Within the literature, there are a number of studies that provide evidence of individuals with ASC experiencing unusual sensory responses, which have utilised behavioural checklists, psychophysiological methodologies and personal accounts.

However, the differing models and conceptualisations of unusual sensory responses in individuals with ASC have led to difficulties in operationally defining this phenomenon and integrating research findings underpinned by different theoretical models (Koziol et al., 2011). It is for this reason that Pollock (2009) proposed that ‘these varying perspectives reflect the difficulties in describing and defining a complex phenomena, and indicate that at present, there is no clear consensus’ (pp. 7). Moreover, a considerable limitation within the literature is that the nature of unusual sensory responses at biological, cognitive and behavioural levels have often been considered in isolation, therefore hindering the integration of research findings across such levels. At present, it is also unclear in the literature as to how conceptualisations of unusual sensory responses in children with ASC link with cognitive theories of ASC in general, for example Mindblindness theory (Baron-Cohen, 1995; Baron-Cohen et al., 1985),
Empathising-Systemising theory (Baron-Cohen, 2002), Weak Central Coherence theory (Frith, 1989) and Executive Dysfunction theory (Ozonoff et al., 1991).

5.2.2 Researching unusual sensory responses in children with ASC within educational settings

The literature review also highlighted that the majority of research into unusual sensory responses in individuals with ASC has been conducted within a clinical or research setting. Sensory behaviours are argued to be influenced by the interaction between an individual and their environment (Brown and Dunn, 2010). Therefore, it is important to understand and identify unusual sensory responses within the context they occur (Dunn, 1994; Dunn et al., 1994). Research into unusual sensory responses demonstrated by children with ASC within educational settings has mainly focused on investigating the impact of unusual sensory responses in children with ASC in the classroom through the use of checklists of behaviours characterising unusual responses to sensory stimuli (Ashburner et al., 2008; Baker et al., 2008; Pfeiffer et al., 2005). However, due to the difficulties conceptualising unusual sensory responses in children with ASC, the present author argued for the need to take a more open ended exploratory approach to researching professionals’ experiences of these responses within educational settings.

5.2.3 Supporting the sensory needs of children with ASC within educational settings

The review of literature highlighted a number of interventions for supporting children with ASC experiencing unusual sensory responses in educational settings. Interventions promoting within-child change included Sensory Integration Therapy (SIT), Sensory Integration-Based interventions, sensory stimulation techniques, Auditory Integration Training (AIT), visual therapies and Multisensory Environments (MSEs). Interventions aimed at accommodating unusual sensory responses in the classroom included changing performance expectations, preparing the child for changes in their sensory environment, gradually desensitising the child to distressing sensory stimuli, providing aids to
help the child cope with distressing stimuli (for example ear defenders), reducing
the level of ‘sensory pollution’ in the classroom, having clear action plans to help
calm the child after a distressful experience (e.g. pleasant stimuli easily to hand),
having a quiet place available for the child to escape to in the event of sensory
overload, and psycho-educational programmes. However, the feasibility of
implementing such interventions within an educational setting has been called
into question (Baranek, 2002). Issues of feasibility have been particularly
highlighted with regards to therapeutic interventions, such as SIT and AIT, due to
the highly specialised and expensive equipment required (Baranek, 2002).
However, there has been considerably less discussion in the literature regarding
the feasibility of interventions based on making environmental changes within
educational settings. It is also evident that although there has been some
consideration of the barriers to supporting the sensory needs of children with
ASC in the classroom, there has been less consideration of the facilitators of
such interventions. The present author also identified a lack of literature
exploring the role that external professionals play in supporting the sensory
needs of children with ASC within educational settings.

5.2.4 Identified gaps in literature

In summary, on reflection of the literature the present author identified a lack of
research qualitatively exploring the conceptual nature of unusual sensory
responses in children with ASC, how these responses are supported within
educational settings and the barriers and facilitators to such support. Therefore,
an opportunity for a research project to gather and qualitatively analyse
professionals’ experiences with regards to the unusual sensory responses of
children with ASC within educational settings was identified.

5.3 Summary of findings

5.3.1 RQ1: What experiences and conceptualisations do Specialist Teachers,
Occupational Therapists and Specialist Educational Psychologists have
regarding unusual sensory responses in children with ASC within an educational
setting?
Six organising themes were identified for RQ1:

- Conceptualisations
- Assessment
- Defining unusual sensory responses
- Pragmatism
- Impact at school
- Professionals’ roles

5.3.1.1 Conceptualisations

Participants voiced a number of conceptualisations of unusual sensory responses in children with ASC, with the present author categorising these conceptualisations as being either behavioural or cognitive in nature. At a behavioural level, participants conceptualised unusual sensory responses in terms of individual sensory domains being affected (sight, touch, smell, taste, hearing, balance and movement), multiple sensory systems being affected at the same time (sensory overload), attention difficulties and motor stereotypies. At a cognitive level, participants conceptualised unusual sensory responses in terms of difficulties with sensory processing and integration, a continuum of sensory thresholds (hyper- and hyposensitivity) and mediating cognitive processes (e.g. ‘effortfulness’, competing cognitive demands).

5.3.1.2 Assessment

Participants voiced a number of difficulties regarding the assessment of unusual sensory responses in children with ASC. Diagnostic ASC assessment tools were felt to lack in depth information regarding a child’s sensory needs. While sensory-specific assessment tools, such as standardised behavioural checklists, were questioned with regards to the extent to which they supported professional practice. Observation was also discussed as an assessment tool, however participants raised concerns about pinpointing behaviours as having a sensory function as opposed to an
alternative function. Some participants therefore discussed using a hypothesis testing approach to the assessment of unusual sensory responses in children with ASC. Participants also voiced that they had experienced difficulties with regards to the logistics of sensory assessments and a lack of designated professionals trained to conduct sensory assessments of children with ASC.

5.3.1.3 Defining unusual sensory responses

Participants' experiences of unusual sensory responses in children with ASC included issues regarding the definition of such responses. The complex nature of unusual sensory responses was highlighted and references made to blurred distinctions between physiological, behavioural and cognitive processes underlying such responses. Participants had also experienced difficulties with regards to the ambiguous nature of unusual sensory responses, for example the idiosyncratic and unpredictable presentation of sensory responses across different individuals. Difficulties were also voiced with regards to distinguishing between unusual sensory responses and behaviours related to the triad of impairments, specifically rigidity of thought. Furthermore, participants had experienced different outlooks and use of terminology between professionals regarding the unusual sensory responses of children with ASC.

5.3.1.4 Pragmatism

Some participants discussed the difficulties they had experienced with regards to practising within the parameters of an incomplete evidence base, for example the constraints imposed on practitioners when making decisions regarding intervention due to inconsistencies in the literature regarding efficacy. Furthermore, when utilising the literature that is available within professional practice, some participants has experienced difficulties translating such research into practice, for example mapping proposed models of unusual sensory responses onto their casework. Some participants also voiced that they had had to be pragmatic with regards to their
professional role, for example having to incorporate consultation on sensory issues into their role due to the lack of access to more specialised practitioners and having to use sensory integration therapy, as opposed to other intervention strategies, in response to client demand. Participants also felt that a pragmatic stance was needed regarding their level of conscious competence in everyday practice due to continuing professional development constraints.

5.3.1.5 Impact at school

Participants voiced that in their experience some children with ASC struggled to access the curriculum due to experiencing unusual sensory responses. Participants had also experienced these children being bullied in school and their sensory responses sometimes negatively affecting their peer relationships. Difficult transitions between educational settings due to changes in the sensory environment were also highlighted. Furthermore, unusual sensory responses in children with ASC were linked with presentations of challenging behaviour in school.

5.3.1.6 Professionals’ roles

Participants felt that the assessment of unusual sensory responses in children with ASC was part of their professional role. Consultation had also been used by participants as a means of raising awareness, providing advice, challenging practice and encouraging schools to adopt new ways of supporting children with ASC experiencing unusual sensory responses. Participants discussed their professional role with regards to intervention for children with ASC experiencing unusual sensory responses mainly in terms of devising strategies to manage unusual sensory responses, as opposed to direct therapeutic intervention. Delivering training and multiagency working were also seen as part of the participants’ roles for supporting children with ASC experiencing unusual sensory responses in school. Participants also identified a number of differences between the roles of practitioners from
different professions, such as the duration of involvement and breadth of focus.

5.3.2 RQ2: What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?

Three organising themes were identified for RQ2:

- Interventions
- Differences between special and mainstream
- Efficacy

5.3.2.1 Interventions

A number of interventions for supporting children with ASC experiencing unusual sensory responses were described by participants. Interventions aimed at remediating unusual sensory responses in children with ASC in educational settings included the use of specialist equipment, sensory diets, sensory rooms, sensory integration based activities and gradual desensitisation. Interventions aimed at managing the unusual sensory responses experienced by children with ASC in educational settings included the use of specialist equipment, making changes to the learning environment, creating a sensory retreat or quiet zone, preparing children for changes in their sensory environment, allowing children to avoid situations likely to result in sensory overload, and increasing children’s awareness and self management of their sensory needs.

5.3.2.2 Differences between special and mainstream

Participants had experienced differences between mainstream and special educational settings with regards to children with ASC experiencing unusual sensory responses. These included mainstream schools not having as good
an understanding of the sensory needs of children with ASC, differences in ethos and differences in provision and access to specialist support.

5.3.2.3 Efficacy

A number of issues regarding the efficacy of interventions aimed at supporting children with ASC experiencing unusual sensory responses in educational settings were identified. The individual nature of children’s responses to intervention was highlighted, with participants experiencing difficulties predicting which intervention strategies would work for which children. Participants voiced that this had sometimes led to a trial and error approach to intervention, rather than the use of research evidence. Concerns were also raised regarding the fidelity of certain interventions, such as sensory integration based activities and sensory rooms. Therefore, participants reflected on the developing nature of the evidence base for supporting children with ASC experiencing unusual sensory responses in educational settings.

5.3.3 RQ3: What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?

Two organising themes were identified for RQ3:

- Barriers
- Facilitators

5.3.3.1 Barriers

A number of barriers to supporting children with ASC experiencing unusual sensory responses in educational settings were voiced by participants. Difficulties accessing external support had led some schools to buy in independent occupational therapy services. Participants identified organisational barriers, such as a lack of flexibility at a whole school level for
supporting individual needs, reluctance to release funding for purchasing resources, competing priorities, curriculum constraints and lack of communication between staff. A number of logistical barriers were also discussed, such as a lack of staffing, lack of physical space to implement sensory interventions, time constraints and a lack of resources and provision. In addition, a number of staff attributes that acted as barriers to support were identified, such as lack of flexibility, unwillingness to try something new, lack of enthusiasm, pessimistic approach to intervention, perception that supporting sensory needs falls outside the educator role, reluctance to take sensory needs seriously, and belief that children are purposely choosing to be disruptive. Organisational barriers, beyond those at a school level, were also highlighted such as a lack of dedicated pathways, lack of OTs on diagnostic teams, funding cuts and constraining models of service delivery.

5.3.3.2 Facilitators

A number of facilitators were perceived by participants to aid the support given to children with ASC experiencing unusual sensory responses in educational settings. Access to external support and the support and cooperation of parents were identified as facilitators. A number of school factors were also highlighted, such as an accommodating organisational culture and a whole school approach to support. Logistical facilitators included having the space available to withdraw children for sensory activities or act as a sensory retreat, flexible staffing, and having access to appropriate resources. Participants felt that facilitative staff attributes included having a flexible approach to support, positive attitude and knowledge, and good understanding and awareness of sensory needs. A number of facilitators, beyond those at a school level, were also highlighted, such as changes to the way in which Statements of SEN were written, flexible models of service delivery, inclusion of sensory needs in diagnostic criteria, and recognition of sensory needs from senior managers within the LA and NHS.
5.4 Theoretical implications

This section will discuss the theoretical implications of the present study’s findings, reflecting on how they fit within and contribute to existing literature in this area.

5.4.1 Conceptualising unusual sensory responses in children with ASC

Professionals’ experiences with regards to conceptualising unusual sensory responses in children with ASC mirrored many of the difficulties reported within the literature (Baranek et al., 2014; Koziol et al., 2011; Pollock, 2009). Firstly, difficulties were discussed regarding terminology. Baranek et al. (2014) stated that ‘myriad terms have been used in the literature to describe the vast array of sensory experiences reported and/or behavioural manifestations evidenced by individuals with ASD’ (pp. 379). This also appears to be the case in practice as participants had experienced different terms and conceptualisations of unusual sensory responses being used by different professionals. For example, one participant commented ‘different nomenclatures used by different people to promote their particular ways of seeing things’.

Secondly, difficulties were discussed with regards to differentiating between unusual sensory responses and behaviours associated with rigidity of thought. Therefore, the experiences of participants support Boyd et al’s (2010) assertion that ‘there is primarily a co-occurrence of hyperresponsive sensory features and repetitive behaviors in children with autism’ (pp. 9). For example, one participant voiced that a child had not liked singing at the dinner table, but that ‘it wasn’t necessarily sensory, it was, you know, that’s not what you do when you’re eating’.

Thirdly, difficulties were discussed with regards to the idiosyncratic nature of unusual sensory responses in children with ASC. For example, participants commented ‘it’s that difficulty of how sensory needs vary between people’, ‘and yet, the same child who hates the noise can be the child who creates a lot of noise’ and ‘it can vary with one person during the day’. This difficulty has also been emphasised within the literature (Baranek, 2014; Hazen et al., 2014) and it
has been put forward that ‘clinically, therapists can be confused when they come across complex combinations of under- and over-responsivity and sensory seeking even within the same modality for individual children’ (Ashburner et al., 2013, pp. 172).

Lastly, difficulties were discussed with regards to translating conceptual models into professional practice. For example one participant commented ‘so I suppose in some ways then, the literature doesn’t really tie in with real life’. This finding is consistent with concerns reported within the literature regarding the external validity of such models. For example, Koziol et al. (2011) argued that ‘the validity of the constructs used to define SPD bears consideration’ (pp. 771). Furthermore, Ashburner et al. (2013) questioned the extent to which Miller et al’s (2007) classification system was able to fully capture all aspects of the unusual sensory responses demonstrated by children with ASC.

Despite participants’ acknowledgements of the difficulties conceptualising unusual sensory responses in children with ASC, the conceptualisations that were discussed reflected the existing literature in a number of ways. Firstly, some participants conceptualised unusual sensory responses in line with models put forward in previous literature, such as Ayres’ (1972) theory of sensory integration and Dunn’s (1997) model of sensory processing. For example, participants discussed a continuum of sensitivity and made reference to sensory thresholds (‘that’s your threshold, isn’t it?’).

Secondly, the conceptualisations discussed by participants echoed the tendency in the literature to concentrate on behavioural and cognitive descriptions of unusual sensory responses in children with ASC. None of the participants discussed conceptualisations at a biological level, for example potential neurobiological underpinnings, which likely reflects the fact that this area has only recently been receiving empirical attention within the literature (Hazan et al., 2014; Koziol et al., 2010; Marco et al., 2011; Mazurek et al., 2013).

Thirdly, the conceptualisations discussed by participants reflect the existing literature with regards to the lack of integration between biological, cognitive and
behavioural aspects of unusual sensory responses in children with ASC. This supports Baranek et al’s (2014) assertion that within the literature there is ‘insufficient collaboration among basic and clinical science disciplines’ (pp. 397).

Lastly, there were some initial indicators that the conceptualisations of unusual sensory responses in children with ASC differed depending on discipline. For example, the present author noted that Specialist Teachers tended to conceptualise unusual sensory responses solely at a behavioural level, OTs tended to make more references to the more traditional ‘OT’ models of sensory processing and integration, and EPs drew more on general cognitive theories of ASC. These distinctions appear to reflect those evident within the literature, for example researchers from more OT backgrounds tending to conceptualise unusual sensory responses with regards to Dunn’s (1997) model of sensory processing, Ayres’s (1972) theory of sensory integration and Miller at al’s (2007) classification system.

The present research contributes to the existing literature base regarding the conceptualisation of unusual sensory responses in children with ASC in a number of ways. The research was exploratory in nature and used open-ended questions rather than relying on a standardised questionnaire based on closed questions and a pre-conceived sensory processing framework. Therefore, it is argued that this rich data set has been able to capture aspects of unusual sensory responses that have not been considered in the literature and are crucial to a deeper understanding of the sensory experiences of children with ASC. For example, one participant hypothesised about the role that mediating cognitive processes could play, such as tiredness or effortfulness; ‘It is very fluid in that sense, there is no, which is why I do struggle sometime with this sort of yes/no switch mentality to these sort of things because it’s variable’. Dickie, Baranek, Schultz, Watson and McCornish (2009) proposed that an important factor in determining a child with ASC’s response to a particular sensory environment was the extent to which they could predict the stimulus, suggesting that the level of control the child has over sensory stimulation (self vs. externally generated) could be a mediating cognitive factor. Marco et al. (2011) also suggested that ‘attentional demands and resources’ (pp. 51) may mediate
unusual sensory responses in children with ASC, meaning that the fewer competing attentional demands, the better the processing of incoming sensory information. However, no further references to mediating cognitive factors were found within the literature. Therefore, the present study’s findings have firstly brought further attention to the role that mediating cognitive processes may play in the conceptualisation of unusual sensory responses in children with ASC and secondly presented novel hypotheses regarding what some of these processes may be.

Within the present author’s literature review in Chapter 2, a considerable limitation within the literature investigating unusual sensory responses in children with ASC was argued to be that the nature of these responses at a biological, cognitive and behavioural level has often been considered in isolation. As discussed in section 2.3.5.2, Frederickson and Cline (2002) put forward a visual framework, termed an Interactive Factors Framework (IFF), which allows ‘both difficulties of development and hypothesised causal influences to be described in terms of biology, cognition, behaviour and environmental factors or interactions’ (Frederickson & Cline, 2002, pp. 26). IFFs have been used to represent theories of development for a range of child development difficulties, including dyslexia (Frith, 1997) and autism (Morton & Frith, 1995). Therefore, in order to contribute to the existing literature base in this area, the present author utilised previous research findings and data from the present study to construct an IFF in order to explore how biology, cognition, behaviour and the environment may interact to produce the observed outcome of unusual sensory responses in children with ASC (see Figure 5.1). The use of such a framework is supported by Rajendran and Mitchell’s (2007) conclusion that ‘by looking at aetiology (e.g., genes), brain mechanisms, cognition and behaviour, autism research (and atypical developmental research, in general) has driven theory advancement and understanding at all these levels’ (pp. 252). Morton and Frith (1995) proposed that a number of basic ‘rules’ should be followed when developing an IFF. In particular, it was argued that researchers should start at the biological level and build causal chains from the biological origin to behaviour in order to give a full account of the signs and symptoms of the condition. Therefore, a detailed description of the present author’s IFF for unusual sensory responses in children
with ASC will now be presented, which will start at the biological level and describe the proposed causal links between biology, cognition, behaviour and environment.

Within the literature several theories have been put forward regarding the neurobiological mechanisms responsible for unusual sensory responses in children with ASC. Hazen et al. (2014) have provided an overview of such theories, which include disruptions in cortical communication (Marco et al., 2011), structural and cellular abnormalities in the cerebellum (Kern, 2002), decreased corpus callosum volume (Hardan et al., 2009), and disruptions in the hypothalamic-pituitary-adrenal axis and amygdala (Mazurek et al., 2013). It is beyond the scope of this thesis to provide a detailed neurobiological account, however it appears likely that at a biological level there are differences in brain structure and functioning in individuals with ASC who experience unusual sensory responses.

At a cognitive level there have been a number of theories proposed regarding the processing of sensory stimuli in individuals with ASC. These theories have discussed difficulties with integrating, modulating and discriminating sensory information (Ayres, 1972; Dunn, 1997; Miller et al., 2007) as well as superior ability to discriminate sensory stimuli (Baron-Cohen et al., 2009). Within this account, ‘integration’ refers to the process by which multiple sensory inputs are assimilated in a meaningful manner, ‘modulation’ refers to the process by which the intensity, duration and strength of incoming sensory information is moderated and ‘discrimination’ refers to the process by which the features, fine details and differences between sensory stimuli are identified. A number of neuropsychological studies have suggested that the brain areas outlined at the biological level of the IFF are engaged during tasks requiring the integration, modulation and discrimination of sensory information (Hazen et al., 2014). Therefore, within the IFF a possible causal link has been proposed between differences in brain structure and functioning and difficulties with sensory integration, modulation and discrimination. A causal link has also been made between such brain differences and superior discrimination ability, however the possible neurobiological mechanisms responsible for sensory strengths has
Figure 5.1 Interactive Factors Framework for unusual sensory responses in children with ASC.
received much less attention within the literature compared to difficulties. Therefore, this link is currently hypothesised.

Within the cognitive level of the IFF a number of mediating cognitive factors are also proposed. The level of effort being put into processing sensory stimuli and the tiredness of the individual were discussed as possible mediating variables by one participant in the present research. For example, the more tired the child is, the more they will experience difficulties in processing sensory stimuli. Within the literature, Dickie et al. (2009) also discussed the level of control an individual has over a stimulus as a possible mediating factor and Marco et al. (2011) suggested that sensory information processing can be mediated by ‘attentional demands and resources’ (pp. 51). Therefore, a causal link has been made between mediating cognitive factors and the cognitive processes of sensory integration, modulation and discrimination.

At the behavioural level, the presentations of unusual responses to sensory stimuli in children with ASC were outlined based on previous literature (Ashburner et al., 2013; Ausderau et al., 2014; Ayers, 1972; Baranek, 2014; Dunn, 1997; Kirby et al., 2014; Miller et al., 2007) and the present research findings. Synesthiasias, difficulties attending to simultaneous sensory stimuli (e.g. not being able to look and listen at the same time), and sensory overload/meltdown (e.g. child appears to shutdown or displays behaviours indicative of severe distress in rich sensory environments) are conceptualised as involving the processing of stimuli in multiple sensory domains. It seems likely therefore that there could be a possible causal link between difficulty integrating sensory information and these three behavioural presentations. Overresponsivity, underresponsivity and sensory seeking behaviours are conceptualised as involving the processing of stimuli within individual sensory domains, for example seeking out proprioceptive stimulation by continuous spinning on the spot. Therefore, a possible causal link between difficulty modulating sensory information and these three behavioural presentations could be made.
Difficulty distinguishing sensory stimuli and superior acuities are also conceptualised as involving the processing of stimuli within individual sensory domains, for example superior ability to discriminate between different tactile sensations. Therefore, possible causal links between difficulty discriminating sensory information and difficulty distinguishing between sensory stimuli, and superior discrimination and superior sensory acuities seem likely. Sensory avoidance/aversion was conceptualised as involving both multisensory processing, for example avoiding situations where multiple sensory stimuli are present, and the processing of individual senses, for example avoiding an individual stimulus that is experienced with too much intensity. Therefore, a possible causal link between sensory avoidance/aversion and difficulties with sensory integration and modulation was hypothesised.

At an environmental level, a number of contextual factors can be represented within the IFF. The amount of sensory stimulation within the environment, for example a high number of sensory stimuli, was represented as a contextual factor and a causal link between this level of stimulation and difficulty with sensory integration made. In other words, it was hypothesised that it was more likely that sensory behaviours causally linked with difficulty with sensory integration would be displayed in environments with a greater amount of sensory stimulation. The predictability of sensory stimuli was also represented as a contextual factor and causally linked with mediating cognitive processes, reflecting the hypothesis that the more unpredictable a stimulus is, the less control an individual has over their response (Dickie et al., 2009). The type of sensory stimulus was also represented as an environmental variable and causally linked with difficulty modulating stimuli, difficulty discriminating stimuli and superior discrimination ability in order to represent the hypothesis that these cognitive processes may only be induced by certain types of stimuli. For example, a child may have difficulty modulating tactile stimuli, resulting in overresponsivity to light touch, but no difficulty modulating auditory stimuli, therefore resulting in appropriate responses to sounds.

It should be noted that this IFF is presented with the aim of stimulating interdisciplinary conceptualisations of unusual sensory responses in children.
with ASC and represents the present author’s best efforts in ‘reconciling terminology and translating across disparate fields from the basic neurosciences through more clinically applied behavioural fields’ (Baranek, 2014, pp. 379). The representation of unusual sensory responses in children with ASC using an IFF serves two functions: one to attempt to provide a richer conceptual understanding of unusual sensory responses in children with ASC and two to highlight the utility of using a multilevel framework to integrate findings from different disciplines and conceptualisations and thirdly to perhaps stimulate discussion regarding the extent to which this multi level conceptualisation matches or deviates from other conceptual understandings of unusual sensory responses in children with ASC.

Within the present author’s literature review in Chapter 2, another considerable conceptual limitation was argued to be the relatively little consideration given to linking conceptualisations of unusual sensory responses in children with ASC and cognitive theories of ASC in general. In the present research, one participant made reference to cognitive theories of ASC in their conceptualisation of unusual sensory responses in children with ASC; ‘it’s definitely an issue around central coherence, executive functioning, even theory of mind. You know, these main theories that we as psychologists espouse are all at their core information processing difficulties’.

Possible links between the processes outlined within the cognitive level of the IFF and the main cognitive theories of ASC are outlined in Figure 5.2. The theory of Executive Dysfunction (Ozonoff et al., 1991) proposes that impairments in social communication, interaction and imagination can be attributed to deficits in executive functioning, an umbrella term for functions such as planning, working memory, impulse control, inhibition, and initiation and monitoring of action. Executive functions are generally considered to be conscious cognitive processes (Hill, 2004), however the cognitive processes associated with unusual sensory responses, which have been termed integration, modulation and discrimination in the present study’s IFF, are argued to occur without conscious thought or effort (Baranek et al., 2014). Therefore, the present author argues that executive functioning difficulties link more with the mediating cognitive processes.
discussed within the IFF, rather than sensory integration, modulation and discrimination.

Weak Central Coherence theory (WCC, Frith, 1989) proposes that impairments in social communication, interaction and imagination result from a bias in information processing such that individual stimuli are well analysed but not integrated effectively into a coherent meaningful Gestalt. This could possibly link with the difficulty in sensory integration described within the cognitive level of the IFF as it would seem plausible that difficulties integrating multiple sources of sensory input could also be described as a difficulty amalgamating local sensory information into a coherent sensory Gestalt. WCC theory may also have links with difficulty in sensory modulation and superior sensory discrimination ability as both these processes could be described as involving a difficulty inhibiting further sensory processing even when the global sensory picture has been identified.

Empathising-Systemising theory (E-S, Baron-Cohen, 2002) posits that individuals with ASC have deficits in empathising but have either intact or superior systemising abilities, this being a drive to analyse or construct systems requiring excellent attention to detail. It would seem that there is some overlap with sensory modulation difficulty, as superior attention to the detail of sensory stimuli could lead to stimuli being over processed and therefore being experienced too intensely or for longer than required. E-S theory could also link well with superior sensory discrimination abilities as this process is likely to require excellent attention to the detail of sensory stimuli.

However, as can be seen in Figure 5.2, no possible links could be established between the theory of Mindblindness (Baron-Cohen, 1995; Baron-Cohen et al., 1985), meaning a difficulty imputing mental states to oneself and others, and difficulties with sensory integration, modulation and discrimination. Furthermore, the theories of WCC, ED and E-S could not be linked with all the processes outlined at the cognitive level of the IFF, for example difficulty discriminating sensory stimuli (as a bias towards processing the details of sensory stimuli
Figure 5.2 Possible links between cognitive processes within IFF and cognitive theories of ASC.
would suggest enhanced, not impaired sensory discrimination). Therefore, it would seem that linking cognitive theories of ASC to conceptualisations of unusual sensory responses in children with ASC, such as the one outlined in the present author’s IFF, may be useful for better understanding the cognitive processes responsible for some, but not all, sensory behaviours.

5.4.2 Researching unusual sensory responses in children with ASC within an educational context

As discussed in section 5.2.2, the majority of previous research into the unusual sensory responses experienced by children with ASC within educational settings has focused on studying their impact within the classroom. The present study’s findings support those of Baker et al. (2008) and Ashburner et al. (2008), as a number of participants discussed the impact of unusual sensory responses on children’s behavioural development and access to the curriculum.

However, the present research has also contributed to the existing literature base by highlighting the potential social impact of experiencing unusual sensory responses on children with ASC, for example greater vulnerability to bullying and negative effects on peer relationships. Humphrey and Symes (2010) found that pupils with ASC experienced higher frequency of bullying and lower levels of social support from parents and peers than either pupils with dyslexia or those without SEN. It has been reported that children and young people with ASC may be more vulnerable to bullying and peer relationship difficulties due to exhibiting behaviours that are viewed as ‘strange’ by their peers (Humphrey & Lewis, 2008). However, the role of unusual sensory responses in children with ASC’s vulnerability to bullying and peer relationship difficulties has not been specifically considered in previous literature. Therefore, the present research findings add to literature which considers potential risk factors for bullying in children with ASC (Hebron & Humphrey, 2013).

Through the use of an exploratory research design, the present research has also broadened the focus of investigation within educational settings. As well as exploring the impact of unusual sensory responses on children with ASC within
educational settings, research findings have been presented with regards to professionals’ conceptualisations of unusual sensory responses, roles in supporting these responses within educational settings and experiences of translating a developing evidence base into practice.

5.4.3 Supporting the sensory needs of children with ASC within educational settings

The interventions available to support the sensory needs of children with ASC within educational settings that were discussed in the present study mirrored those reported within existing literature (Baranek, 2002). Concerns within the literature regarding the efficacy of sensory interventions for children with ASC were also voiced in the present research. Baranek (2014) concluded that ‘practitioners and families are often confronted with making therapeutic decisions in the face of a limited evidence base’ (pp. 395). This was also true of the practitioners interviewed in the present research, with one participant commenting that ‘there’s all the sensory integration literature, which there’s masses of, although there’s not a great deal of proper evidence to support it’. Ausderau et al. (2014) proposed that ‘due to the heterogenous nature of ASD and sensory features, children’s responses to interventions are likely to be individualised and varied’ (pp. 8). This was also reflected within the present findings, for example one participant voiced ‘it’s been very individual to the young person’. Therefore, as reported within existing literature, the present research findings highlight the developing nature of the evidence base for intervention.

The present research findings regarding the barriers to supporting the sensory needs of children with ASC within educational settings also emulate findings from previous literature. Baranek (2002) put forward that interventions aimed at remediating unusual sensory responses, for example SIT, lack feasibility within educational settings due to the equipment, space and time required for delivery. These feasibility issues were also discussed by participants in the present study. The feasibility of applying sensory based interventions (SBI) within an educational context has also been questioned with regards to a ‘mismatch
between the goals and intent of SBI and the child’s academic learning, lack of training of the adult who applied and monitored the sensory strategies, misunderstanding of how and for whom the sensory strategies would be beneficial, and lack of potency’ (Case-Smith Weaver & Fristad, 2014, pp. 12). Consistent with this existing literature, issues regarding the fidelity of sensory interventions used within educational settings were discussed by participants in the present research. For example, participants commented ‘some people will say we’re doing some sensory work and sometimes that is just having some furry things out or some flashy toys’, ‘they [sensory intervention activities] morph into more educational activities’, and ‘I don’t think, generally, the understanding is there of the sensory needs’.

As well as supporting the findings of previous research, the present research has also contributed to the literature base with regards to supporting the sensory needs of children with ASC within educational settings. The majority of existing literature has focused on interventions aimed at remediating the unusual sensory responses experienced by children with ASC in educational settings. However, the present study’s findings suggest that in practice greater consideration may be given to interventions aimed at managing, as opposed to remediating, such responses. The present study has also broadened the focus of research into intervention by presenting findings related to the role that external professionals play in supporting the sensory needs of ASC within educational settings.

Furthermore, the present research builds on existing literature regarding the feasibility of interventions. Firstly, the present research findings provide an in-depth analysis of feasibility issues regarding interventions aimed at managing unusual sensory responses, contrary to existing research which has focused more on interventions aimed at remediating unusual sensory responses. Secondly, a more detailed exploration of the facilitators to supporting the sensory needs of children with ASC within educational settings are presented, which have not been considered within previous literature. Lastly, the present research contributes to the literature base by considering the barriers and facilitators to supporting children with ASC experiencing unusual sensory responses within
educational settings at a systemic level, which has been neglected within previous literature.

5.5 Implications for professional practice

This section will discuss the implications of the present study’s findings for professional practice. The present author will discuss these implications with regards to conceptualisation, assessment, intervention, systemic practice and multiagency working.

5.5.1 Conceptualising unusual sensory responses in children with ASC

The present study has highlighted the conceptual ambiguity surrounding the nature of unusual sensory responses in children with ASC and the need for professionals to take a pragmatic approach when translating conceptual models and theories into practice. Specifically with regards to EPs, many authors have emphasised that the unique contribution of the EP is helping others to make sense of complex problems (Cameron, 2006). It is argued that this often involves ‘the twin challenges of linking highly specific, frequently-piecemeal research with the urgent and often-messy demands of the real world’ (Cameron, 2006, pp. 292). Burnham (2013) reported that this tension between using research evidence within complex, real world situations can lead to EPs feeling uncertain about the scientific basis to their work and professional credibility. In the present study, some participants overcame such difficulties by using a hypothesis testing approach within their practice, for example voicing ‘it’s a bit of a problem-solving effect sometimes; you’re presenting them, to see is that what’s causing the problem?’ The present author therefore argues that EPs may need to take more of a hypothesis testing approach to conceptualising the sensory needs of children with ASC within casework, which is informed but not determined by top down conceptual models.

The study’s findings also emphasise the need for professionals to conceptualise unusual sensory responses in children with ASC beyond observable behaviours in the classroom in order to acknowledge the potential biological and cognitive
factors involved. The present author proposes that the IFF presented within section 5.4.1 provides a good starting point for such conceptualisations. Furthermore, it is argued that the study’s findings highlight the need for professionals to acknowledge the conceptual ambiguity surrounding unusual sensory responses in children with ASC when delivering training and engaging in consultation with other professionals, school staff and parents.

5.5.2 Assessment of unusual sensory responses in children with ASC

The present study’s findings draw attention to the constraints experienced by professionals regarding the assessment of unusual sensory responses experienced by children with ASC. In particular, it is argued that professionals be aware of the limits to assessing unusual sensory responses at a purely behavioural level, for example through using observation and standardised checklists, due to the difficulties distinguishing between the functions of such behaviours. The present study’s findings also indicate that the assessment of unusual sensory responses in children with ASC within educational settings is not confined to one professional discipline. Therefore, as discussed in the literature regarding best practice in multiagency collaboration (Atkinson, Wilkin, Stott, Doherty & Kinder, 2002) the present author argues that clear communication between practitioners is essential in order to delineate professional roles. Linked with this, the present research findings suggest that within practice, some Local Authorities (LAs) lack dedicated pathways for the assessment of unusual sensory responses of children with ASC, which will inevitably impact on professional practice regarding the consistency and quality of sensory assessments for children with ASC within educational settings.

5.5.3 Supporting the unusual sensory responses in children with ASC within educational settings

The present research findings have a number of implications for professional practice regarding the interventions used to support the sensory needs of children with ASC in educational settings. The present research has highlighted the sensory challenges that some children with ASC experience during
transitions between educational settings, which has not been considered in previous literature. Therefore, it is put forward that professionals supporting these children during transitions need to be aware of the sensory challenges associated with transition as well as changes to routine. The differences in understanding, ethos and available provision between mainstream and special educational settings were also emphasised by participants in the present research, which are likely to impact practice regarding consultations with staff and the implementation of intervention programmes. Furthermore, participants in the present study discussed the nature of support provided to educational settings by external professionals, in particular the need for more practical support when implementing intervention strategies as well as consultation. Therefore, professionals providing external support to staff in educational settings may wish to consider the extent to which ‘on the ground’ support can be incorporated into their practice. Finally, it is proposed that the present research findings aid decisions in professional practice made regarding intervention for children with ASC experiencing unusual sensory responses, due to a greater understanding of the potential barriers and facilitators of such support.

5.5.4 Multiagency working

The present research findings have a number of implications for professional practice with regards to working in multiagency teams and liaising with practitioners from different disciplines. Multiagency working has received much attention within the literature and been the focus of a number of Government strategies aimed at promoting positive outcomes for children and young people (e.g. Atkinson et al., 2002; Children Act, 1989; Working Together to Safeguard Children, 1999; Every Child Matters, 2003). Consequently, there is a growing literature base regarding the barriers and facilitators to best practice within multiagency working. One such barrier, discussed by Frederickson and Cline (2002), is that practitioners are often socialised during training to use profession-specific vocabulary. A number of researchers have argued that differences in professional language and terminology during multiagency working can create difficulties when conceptualising and communicating about the nature of presenting concerns (Atkinson et al., 2002; Daniels et al., 2007; Frederickson &
Cline, 2002; Milbourne, Macrae & Maguire, 2003). Therefore, one of the facilitators to successful multiagency working that has been frequently reported within the literature is the development of a shared professional language to aid inter-profession communication (Robinson & Cottrell, 2005; Williams & Salmon, 2002). The present study’s findings highlight that within practice a number of different terms and nomenclatures for conceptualising and communicating about unusual sensory responses in children with ASC are utilised by professionals. Therefore, when working alongside practitioners from differing professions within a piece of casework or within a multidisciplinary team it is suggested that practitioners be mindful of such issues in order to facilitate more effective communication and information sharing regarding the sensory needs of children with ASC. It may be prudent at the beginning of multiagency involvement for professionals to explicitly clarify such terminology and resolve any incongruities, in order to develop a shared understanding of the child’s difficulties and facilitate more effective interagency collaboration.

Another barrier commonly discussed within the literature relates to overlaps in professional role and responsibilities during multiagency working. This has been reported to be a particular difficulty when working within a multiagency team, with Gaskell and Leadbetter (2009) finding that Educational Psychologists (EPs) indicated ‘many of their roles in a multiagency team were interchangeable, with less distinctive roles identifiable’ (pp. 106). In addition, a blurring of professional boundaries has also been reported to occur during multiagency collaboration at a casework level (Frederickson & Cline, 2002). Atkinson et al. (2002) argued that such difficulties can restrict the unique contribution of distinct professionals, create tensions over areas of responsibility and lead to misunderstandings regarding boundaries of knowledge. Booker (2005) further argued that professional identity may be threatened, which is reported to play an integral role in effective multiagency working (Lewis & Crisp, 2004). Therefore, an important facilitator to successful multiagency working has been argued to be the clear delineation of professional boundaries with regards to role and responsibilities (Atkinson et al., 2002). The present research findings highlighted certain commonalities between the roles and responsibilities of professionals from different disciplines with regards to supporting children with ASC experiencing
unusual sensory responses. For example, all of the participants, even though from three distinct professions, discussed having responsibility for the assessment of unusual sensory responses in children with ASC and the planning and delivery of intervention. Therefore, it is suggested that practitioners keep in mind the potential for misunderstandings of role and duplications of work when supporting children with ASC experiencing unusual sensory responses. In order to ensure successful multiagency working it is likely that professionals will need to overtly demarcate their roles and boundaries of practice prior to collaboration.

A number of barriers to effective multiagency working have also been reported related to differences in models of service delivery. Atkinson et al. (2002) propose that differences in funding, time allocated to casework and working cultures between practitioners from different professions can to lead to difficulties developing clear aims and objectives which are understood and accepted by all agencies. Therefore it is proposed that in order to overcome such barriers, professionals working in a multiagency manner should negotiate agreed timetables for the planning and delivery of work and ensure that there are clear lines of responsibility and accountability (Sloper, 2004). The present study’s findings highlight the differences between models of service delivery within the disciplines of Specialist Teaching, Educational Psychology and Occupational Therapy. For example, professionals’ duration of involvement and breadth of focus during casework. Therefore it is suggested that practitioners should be attentive to such differences and ensure that the facilitators discussed above are in place in order to promote more effective joint working and intervention between agencies.

5.5.5 Systemic development

The present author proposes that the study’s findings have implications for professional practice with regards to the role practitioners play in systemic development. Participants in the present research discussed part of their role in terms of going beyond the child level and raising awareness of the sensory needs of children with ASC within educational settings at an organisation level. Therefore, it is argued that within practice professionals need to act as
consultants not only to school staff working with children with ASC and their parents, but also to senior managers and policy makers within LA s and the NHS.

5.5.6 Pragmatism within professional practice

The present research findings have a number of implications for professional practice with regards to practising within the parameters of an incomplete evidence base and translating the research that is available into practice. Evidence based practice (EBP) has been defined as ‘the integration of the best available research with clinical expertise in the context of patient characteristics, culture and preferences’ (APA, 2006, p.273) and therefore denotes that there should be a clear link between professional practice and research evidence. EBP is argued to have become a dominant ideology within the education field (Fox, 2003) and has been promoted heavily when working with special populations, such as children and young people with SEN (Kratochwill & Shernoff, 2004; Kratochwill & Stoiber, 2002). More specifically, Hoagwood and Johnson (2003) advocate that specialist educational professionals play a central role in using EBP to bridge the gap between research and practice in relation to supporting children and young people with ASC. Trinder and Reynolds (2000) put forward a number of benefits to using EBP in education, including more effective and efficient practice, transparent decision making, empowered practitioners and research consumers, and improved multidisciplinary working. Alongside the support for EBP within the academic literature, there has been a growing emphasis on EBP within a political context, with Fox (2003) arguing that ‘one of the main reasons for the promotion of evidence-based practice is the pressure on, and from, politicians’ (pp. 91).

However, as evident within the present author’s literature review in Chapter 2, and echoed in the research findings, there is currently an underdeveloped evidence base regarding the conceptualisation of unusual sensory responses in children with ASC and appropriate support for these needs within an educational context. Despite this, practitioners from a range of professions are often called upon to offer consultation, advice and intervention within educational settings regarding the sensory needs of children with ASC. This theme was illustrated in
the present research by participants commenting: ‘the research base isn’t clear at this stage’, ‘I could well be wrong’, ‘guesswork’, ‘did our best with what we thought’, ‘try them all and see what works best’. Therefore, the extent to which practice can and should be based on the research evidence is called into question. This reflects a wider debate in the literature regarding the limitations of EBP (Burke & Gitlin, 2012; Carter, 2002; Copley and Allen, 2009; Gibbs & Gambrill, 2002; Norcross, Beutler & Levant, 2011; Trinder & Reynolds, 2000). Limitations of particular relevance to the present research relate to the philosophical stance of ‘pragmatism’ (Burnham, 2013; Fishman, 1999) and the growing calls for the use of practice based evidence (PBE) alongside EBP (Barkham, Hardy & Mellor-Clark, 2010; Fox, 2003).

Fishman (1999) contrasts two models of professional practice, which are argued to reflect the epistemologies of ‘positivism’ and ‘pragmatism’. It is proposed that those practitioners more closely allied with a positivist model of practice adhere strictly to a linear model in which the laws underlying human nature are researched, disseminated and subsequently applied by practitioners in their work with clients. Therefore, in this model, practitioners are argued to be ‘appliers of basic knowledge’ (Fishman, 1999, pp. 9). In contrast, Fishman (1999) proposed that by taking a more pragmatic stance to professional practice, practitioners become active researchers and practice becomes ‘professional activity as disciplined inquiry’ (Peterson, 1991, pp. 422). This philosophy supports Denzin and Lincoln’s (2008) description of professionals as ‘bricoleurs’ (Levi-Strauss, 1966), meaning practitioners who plan and deliver tailored interventions to clients despite ‘often less than ideal theoretical and practical materials at hand’ (Burnham, 2013, pp. 26). Linked with this philosophy of pragmatism is the paradigm of practice based evidence (PBE), which:

‘starts from a position of capturing the reality of everyday routine practice and finding ways of evaluating and improving it by adopting a bottom up approach – that is, starting with the work of practitioners and building the evidence base upwards to the level of policy rather than vice versa’ (Barkham, Hardy & Mellor-Clark, 2010, pp. 331).
There has been increasing interest in the use of PBE within professional practice in response to calls for improvements to the external validity of evidence bases (Barkham & Mellor-Clark, 2003; Green, 2008). Barkham et al. (2010) have proposed that EBP and PBE should work in harmony through a complementary cycle of EBP research and PBE activity, which they argued would facilitate a ‘more robust and relevant knowledge base’ (pp. Preface xxi). Therefore, it is argued that professionals involved in supporting the sensory needs of children with ASC should develop and maintain a critical awareness of the evidence base related to their practice, but ultimately may need to act as ‘bricoleurs’ in light of the developing nature of the evidence base. This links with the use of a hypothesis testing approach that was discussed by participants in the present research; ‘you know, we’re trying to, sort of…it’s a bit of a problem-solving effect sometimes you’re presenting them, to see is that what’s causing the problem’. Furthermore, it is argued that in order to promote the development of a more robust knowledge base, professionals should recognise the opportunities created for PBE and act accordingly by utilising systematic frameworks of hypothesis testing (Clark and Alvarez, 2010) and data driven interventions (Schaaf & Blanche, 2012) within their practice.

A number of models of professional practice have been put forward to facilitate the systematic testing of hypotheses and implementation of data driven interventions within casework, therefore supporting the development of PBE. Peterson (1991) proposed the model termed ‘professional activity as disciplined inquiry’ (see Figure 5.3), which emphasised a reflection in action approach to therapeutic intervention with clients. Monsen, Graham, Frederickson & Cameron (1998) put forward the problem analysis model, which supports educational professionals, in particular EPs, to generate and test various hypotheses in order to inform effective intervention and evaluation. It also appears that within the profession of occupational therapy there is a growing emphasis on the use of systematic models of practice to facilitate PBE (Schaaf & Blanche, 2012).
Therefore, it could be argued that the development of PBE with regards to the sensory needs of children with ASC would be well supported. However, the extent to which systematic models are used in practice, and therefore the potential for the development of PBE, has been questioned. Previous literature investigating the use of the problem analysis model (Monsen et al., 1998) reported that one of the least applied steps of this model within EP practice was the stage dedicated to hypothesis testing (Kelly, 2006). Within the occupational therapy profession, the recent nature of Schaaf & Blanche’s (2012) paper on data driven interventions suggests that problem solving models are also not yet fully embedded into OT practice. The extent to which systematic hypothesis testing was used by participants in the present research was also mixed. Some comments from participants suggested a less targeted approach to assessment and intervention, such as ‘it’s a bit of guesswork’ and ‘try them all and see what seems to work the best’. However, other participants indicated that they used a hypothesis testing approach, for example ‘it’s a bit of a problem-solving effect sometimes; you’re presenting them, to see is that what’s causing the problem?’. Therefore, it is argued that in order to lay the foundations for the development of PBE, and promote effective outcomes despite the underdeveloped evidence base, practitioners need to be utilising systematic models of professional practice when working with children with ASC experiencing unusual sensory
responses. This is supported by Fox’s (2003) assertion that ‘a commitment to researching our own individual practice may be the starting point for an evidence-based profession’ (pp. 101).

5.6 Limitations of the present research and recommendations for further research

This section will discuss the limitations of the present research and recommendations for further research with regards to data gathering, analytic generalisability, cross professional analysis, unusual sensory responses and theories of ASC, Interactive Factors Frameworks (IFFs) and qualitative research.

5.6.1 Data gathering

Following the thematic analysis of participants’ interviews, the theme of ‘pragmatism’ arose from the data. This theme reflected participants’ experiences of translating the developing evidence base on unusual sensory responses in children with ASC within educational settings into practice. However, it was only during data analysis that the present author reflected on these experiences fully, therefore, with hindsight it would have been beneficial to have further questioned participants on their use of pragmatism within professional practice during the interviews. Thus, the present author suggests that further investigation of how professionals access, interpret and utilise research on unusual sensory responses in children with ASC within their practice is warranted. Further investigation could take the form of an action research project, which would provide an opportunity for relevant professionals to engage in the process of actively researching and investigating the difficulties they face in translating the developing evidence base on unusual sensory responses in children with ASC into practice with a view to deepening understanding of the pragmatic issues related to their role.

5.6.2 Analytic generalisability

The purpose of the present study was to explore professionals’ experiences of the unusual sensory responses of children with ASC within educational settings.
The present research therefore utilised an exploratory single-embedded case study design, which provided detailed insight into professionals’ experiences, however did not confer generalisability. Yin (2009) argued that although case study designs do not afford statistical generalisability, they can afford analytic generalisability, meaning that they can assist in generalising or applying a particular set of results to a broader theory, which can be used as the foundation for replication studies. Therefore, the greater number of studies with similar findings that are reported, the more promising the evidence is of analytic generalisability. The present author acknowledges that the experiences of the professionals in the present research cannot be generalised to other professionals, however the study does provide rich data, which could be used alongside evidence from similar studies to facilitate analytical generalisability. Therefore, it is argued that further exploration of professionals’ experiences of unusual sensory responses in children with ASC within educational settings would be beneficial.

5.6.3 Cross professional analysis

As discussed in section 5.4.1, there were some initial indicators that the experiences of professionals with regards to unusual sensory responses in children with ASC within educational settings differed depending on discipline. Cross-professional analysis of practitioners’ experiences with regards to the sensory needs of children with ASC could therefore present a beneficial avenue for further research. Findings from such research would provide valuable information to practitioners working within multidisciplinary teams and stimulate further inter-disciplinary dialogue on this topic.

5.6.4 Unusual sensory responses and theories of ASC

The present author’s literature review highlighted that the links between conceptualisations of unusual sensory responses and general theories of ASC have not been greatly considered. There has been some discussion in the literature as to how Weak Central Coherence theory (Blakemore et al., 2006) and Empathising-Systemising theory (Baron-Cohen et al., 2009) can account for
the behavioural response pattern of hypersensitivity. However, the links between
the cognitive processes involved in unusual sensory responses and general
cognitive theories of ASC have only been postulated within the present research
(see Figure 5.2). The present author suggests that this lack of integration reflects
a wider disconnection in the literature between research papers within the
occupational therapy profession and those within the field of psychology.
Therefore, it is argued that further interdisciplinary research is needed to explore
the relationship between cognitive processes allied with conceptualisations of
unusual sensory responses and those put forward in general cognitive theories
of ASC. It is argued that such research would facilitate a more informed
conceptual understanding of the unusual sensory responses of children with
ASC.

5.6.5 Interactive Factors Frameworks (IFFs)

The present author has identified that a considerable limitation within the
literature is that while unusual sensory responses in children with ASC have
been considered at neurobiological, cognitive and behavioural levels, there has
been little integration across these levels. This was also reflected in the
experiences of the professionals interviewed in the present research as their
conceptualisations of unusual sensory responses in children with ASC did not
include discussion of any proposed causal links between biological, cognitive
and behavioural levels. In order to further the conceptual understanding of the
unusual sensory responses of children with ASC and stimulate interdisciplinary
dialogue, the present author has presented a proposed IFF (see Figure 5.1). It is
hoped that this may act as a catalyst, and provide a useful framework, for further
consideration and interdisciplinary research on unusual sensory responses in
children with ASC across biological, cognitive and behavioural levels. This
echoes the sentiments of Koziol et al. (2011), who call for ‘translational research
between clinical professions and a unification of nomenclatures and
terminologies so that we can better understand and serve the patients we
evaluate and treat’ (pp. 786).
5.6.6 Qualitative research into the unusual sensory responses of children with ASC

As highlighted throughout Chapter 2, the majority of research investigating unusual sensory responses in children with ASC has employed methodologies that impose theoretical frameworks onto these experiences and are therefore top down, theory-driven investigations. Studies utilising qualitative methodology to conduct more inductive investigations of the sensory experiences of children with ASC are few in number (Ashburner et al., 2008; Kirby et al., 2014; Robertson, 2012) and do not specifically investigate these experiences from an educational viewpoint. The present study is the first to qualitatively investigate professionals’ experiences with regards to unusual sensory responses demonstrated by children with ASC within educational settings. It is therefore argued that there is the need for further qualitative research into the sensory experiences of children with ASC within educational settings from the perspective of the children themselves, their parents and professionals supporting them. This is echoed by Ashburner et al. (2013) who conclude that:

‘Although the currently used categories of under- and over-responsiveness and sensory seeking are useful descriptors, they may not fully capture aspects that are crucial to a deeper understanding of sensory experiences of people with ASD. Rather than relying solely on standardised questionnaires which involve closed questions and a pre-conceived sensory processing framework, open-ended questions...may be more effective in drawing out sensory-related issues that are unique to the individual and his or her context’ (pp. 178).
References


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Appendices

APPENDIX A: Interview schedule.

1. Can you tell me a bit about a school aged child with autism you have supported recently?

Prompts: Reason for involvement, nature of involvement, strengths/difficulties of child, how the child was presenting in their educational setting.

2. In your experience what unusual responses to sensory stimuli do children with ASC show when in an educational setting?

Prompts: Different kinds of responses, which senses affected, most common response patterns.

3. Are you aware of any research or literature that discusses unusual sensory responses in children with ASC?

Prompts: Which pieces of literature/models? Do you feel this literature links well with your practical experiences?

4. What is your role in supporting children with ASC who experience unusual sensory responses in an educational setting?

Prompts: Direct work? Indirect support- raising awareness, making recommendations?

5. In your experience what school based interventions are used to support the sensory needs of children with ASC you have been involved with?

Prompts: Direct therapies? Classroom accommodations?

6. What do you feel are the facilitators to supporting the sensory needs of children with ASC in an educational setting?

Prompts- Logistical factors, school factors (skill level of staff, attitudes/opinions), organisational factors (service delivery models, service policies), scope of your professional role

7. What do you feel are the barriers to supporting the sensory needs of children with ASC in an educational setting?

Prompts- Logistical factors, school factors (skill level of staff, attitudes/opinions), organisational factors (constraining service delivery models, service policies), scope of your professional role
APPENDIX B: Nvivo screen shots.

The following screen shots show that a number of quotes were used in the development themes and demonstrate that there was sufficient evidence to support the themes identified from the transcripts.
APPENDIX C: Chain of evidence from full transcript to organising themes.

This appendix describes the chain of evidence from full transcript to organising themes and provides screen shots to aid understanding.

Step 1: Transcribing the data
All interviews were recorded using an audio recording device and transcribed using Microsoft Word software. On occasion, segments of the audio were considered inaudible and labelled so within the transcript. Any names or places discussed in the interviews were anonymised.

Step 2: Coding the data set
Following transcription, each interview was uploaded onto NVivo 10, a type of Computer Assisted Qualitative Data Analysis (CAQDAS) software. An NVivo 10 file was created for each interview.
Each transcript was coded individually using NVivo 10. Segments of text were highlighted and coded by creating a free node for each extract. After each interview had been coded in this way, the free nodes were then condensed into overarching nodes, demonstrated below by the hierarchical structure in the screen shot below.

Step 3: Theming the data set

After all interviews had been coded, similar nodes that had emerged throughout the data set began to be organised into themes. Parent nodes were created to represent themes and the codes linked with each theme were moved into this parent node. This process generated subthemes, basic themes and organising themes. Therefore grandparent nodes were created to denote the organising themes. For example, as can be seen from the screen shot below, the organising theme of ‘conceptualisations’ originated from the identification of the basic themes termed ‘behavioural’ and ‘cognitive’, which were derived from a number of subthemes (‘individual senses’, ‘multiple senses’, ‘attention’, ‘motor’, ‘sensory processing and integration’, ‘hyper-hypo continuum’ and ‘other cognitive processes’).
Following this, the hierarchical structure of nodes, parent nodes and grandparent nodes were reviewed and resulted in small changes to the themes on occasion. This hierarchical structure of themes was then utilised to create a thematic network for each Research Question using the Smart Art tool in Microsoft Word (shown in the screen shot below).

This represents an outline of the coding process from audio recording to final themes.
APPENDIX D: Inter coder table.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes from Coder A</th>
<th>Codes from Coder B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff attributes</td>
<td>Staff awareness</td>
<td>Understanding and approaches of staff</td>
</tr>
<tr>
<td></td>
<td>Staff acceptance</td>
<td>Independent thinking of staff</td>
</tr>
<tr>
<td></td>
<td>Staff flexibility</td>
<td>Staff attitudes and opinions</td>
</tr>
<tr>
<td></td>
<td>Thinking outside the box</td>
<td>Need staff awareness. Staff flexibility.</td>
</tr>
<tr>
<td></td>
<td>Positive attitudes and opinions</td>
<td>Staff awareness of how to implement a workstation</td>
</tr>
<tr>
<td></td>
<td>Lack of flexibility of staff</td>
<td>Barrier – lack of flexibility – personalised approaches.</td>
</tr>
<tr>
<td></td>
<td>Think child choosing to be difficult</td>
<td>Barrier – one size fits all.</td>
</tr>
<tr>
<td></td>
<td>Lack of empathy</td>
<td>Staff flexibility to remove child from class.</td>
</tr>
<tr>
<td></td>
<td>Cynical staff</td>
<td>Barrier – a person who lacks flexibility. One size fits all.</td>
</tr>
<tr>
<td></td>
<td>Want to over manage children</td>
<td>Barrier – a person’s lack of understanding of children’s needs.</td>
</tr>
<tr>
<td></td>
<td>Not accepting individuality of child</td>
<td>Barrier – a person not able to offer empathy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – adults lacking empathy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – adult who lacks empathy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – adult who is cynical.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – over managerial adults.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – adults who decrease child’s independence.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – adults who want to ‘normalise’ the child.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – adults who want to change the child to be like others.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – adult who is not accepting of the child.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – adults who do not embrace individuality of child.</td>
</tr>
<tr>
<td>Physical environment</td>
<td>Lack of space</td>
<td>Physical environment</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td>Lack of appropriate furnishings</td>
<td>Availability of rooms</td>
</tr>
<tr>
<td></td>
<td>Constrained by physical environment</td>
<td>Availability of equipment/resources</td>
</tr>
<tr>
<td></td>
<td>Poor layout of buildings</td>
<td>Constrained by environment</td>
</tr>
<tr>
<td></td>
<td>Creative use of space</td>
<td>Need a tailored environment</td>
</tr>
<tr>
<td></td>
<td>Good spaces within new school buildings</td>
<td>Reflection of a school’s expectation to teach through a high stimulus environment</td>
</tr>
<tr>
<td></td>
<td>Flexible use of space</td>
<td>Reflection that classroom environments are high stimulus</td>
</tr>
<tr>
<td></td>
<td>Highly stimulating learning environment</td>
<td>Need low stimulus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Need different model of learning. Low stimulus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flexibility of environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New school buildings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Availability of small spaces.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flexible spaces in ‘new’ schools</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smaller classrooms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recognition of conflict in schools to want big classrooms and smaller usable rooms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New build schools have better spaces/work better.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Building ‘new’ schools helps.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘New’ school buildings have more facilities for sensory needs – carpets.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access to support</th>
<th>Access to OT support</th>
<th>More OT support/work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OTs working in schools</td>
<td>More multiagency working.</td>
</tr>
<tr>
<td></td>
<td>Reviewing TA support</td>
<td>More OTs working in schools.</td>
</tr>
<tr>
<td></td>
<td>Having TA support</td>
<td>Barrier – reduce TA support and reliance on TAs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TA as positive facilitator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pro and con of TA support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – flexibility of TA support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facilitator – TA support.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barrier – TA support lost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facilitator – flexible and</td>
</tr>
<tr>
<td>Curriculum</td>
<td>Curriculum pressure</td>
<td>balanced support</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>Fast paced curriculum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multisensory teaching approaches</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of flexibility to change curriculum delivery for minority</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Time constraints</td>
<td>Barrier – time to focus on sensory needs. Barrier – time to give sensory stimulus.</td>
</tr>
<tr>
<td>Models of service delivery</td>
<td>Lack of staffing</td>
<td>Barrier – lack of staff. Barrier – lack of follow up work Barrier – lack of time of service support. Modelling. Direct support. Staffing. Barrier – service flexibility. Staffing. Barrier – availability of service time to develop the skills/understanding of school staff. Staff constraints. Barrier – ability to offer direct support. Barrier – can only offer verbal support. Barrier – lack of ability to model. Barrier – working constraints (time)- leading to people may misunderstand advice. Barrier – ability to observe</td>
</tr>
<tr>
<td>Interventions</td>
<td>Workstations</td>
<td>Implementation of strategies.</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Unit for ASC attached to school</td>
<td>Need for a workstation</td>
</tr>
<tr>
<td></td>
<td>Sensory retreats</td>
<td>Flexibility to leave the environment for short periods of time.</td>
</tr>
<tr>
<td></td>
<td>Psycho-education strategies</td>
<td>Provision in the authority.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ASD unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit attends to children’s sensory needs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ASD units attached to two mainstream schools.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit has helped children.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Need for a quiet room</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Children prefer quiet room.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Helping children understand their sensory needs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TA supporting children to understand their sensory needs.</td>
</tr>
<tr>
<td>Professional role</td>
<td>ST role- managing expectations</td>
<td>Manage expectations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Children’s and others.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manage expectations has helped.</td>
</tr>
<tr>
<td>Conflicting needs of children with the</td>
<td></td>
<td>Reflection that the needs of other children are different to those of children with sensory</td>
</tr>
<tr>
<td>classroom</td>
<td></td>
<td>difficulties.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental needs are different to other learners.</td>
</tr>
</tbody>
</table>
APPENDIX E: Cohen’s Kappa statistic.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>1</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>18</td>
</tr>
</tbody>
</table>

Number of observed agreements: 17 (94.44% of the observations)
Number of agreements expected by chance: 9.0 (50.00% of the observations)

Kappa = 0.693
SE of kappa = 0.107
95% confidence interval: From 0.670 to 1.000
The strength of agreement is considered to be 'very good'.

This calculator was changed in April 2011 to use a better equation for computing the SE and confidence interval of Kappa. It now uses equations 18.16 to 18.20 from Fleiss, *Statistical Methods for Rates & Proportions* (3rd edition). It did not work between Aug. 1 and Sept. 7, 2012.
APPENDIX F: Participant information sheet.

A case study investigation into the sensory needs of children and young people with Autistic Spectrum Condition (ASC) within an educational context

Participant Information Sheet

You are being invited to take part in a research study that will be assessed as part of the researcher’s Doctorate in Educational and Child Psychology. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

Who will conduct the research?
Alison Hughes: Educational Support and Inclusion (ESI), School of Education, Ellen Wilkinson Building, The University of Manchester, Oxford Road, Manchester, M13 9PL.

Title of the Research
A case study investigation into the sensory needs of children and young people with Autistic Spectrum Condition (ASC) within an educational context

What is the aim of the research?
There is a growing evidence base to suggest that a number of children with ASC experience unusual responses to sensory stimuli. However, there is a lack of consensus regarding the exact nature of these difficulties and the majority of research has investigated these difficulties in a clinic or research based setting. The present research is an exploratory investigation into the unusual sensory responses exhibited by children with ASC within an educational context. Furthermore, the present research aims to explore how these sensory needs are currently being supported in educational settings.
**Why have I been chosen?**
You have been asked to participate in the research because you are a professional with a specialism in ASC and have experience of supporting children with ASC in educational settings.

**What would I be asked to do if I took part?**
You will be asked to participate in an informal interview with the researcher during which you will be asked about your experiences of supporting children with ASC in educational settings. The interview will have a particular emphasis on discussing the nature of unusual sensory responses in children with ASC and how these children are supported in educational settings. The interview will be audio recorded for transcription purposes and will last for approximately 45 minutes.

**What Happéns to the data collected?**
Your interview will be transcribed by the researcher and any names/places will be anonymised. After this the researcher will look in detail at what was said in the interviews to try and identify themes relating to the study’s research aims.

**How is confidentiality maintained?**
All information that is collected during this study is strictly confidential. No-one other than the researcher will listen to the audio recording of your interview without your explicit permission. All recordings and transcriptions will be kept securely in a locked filing cabinet or on an encrypted data stick. The audio recording and transcript of your interview will be stored securely for five years after being collected.

**What happens if I do not want to take part or if I change my mind?**
It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time without giving a reason and without detriment to yourself or your school.

**Will I be paid for participating in the research?**
There will be no payment for participating in this research.

**What is the duration of the research?**
1 x 45 minute interview.

**Where will the research be conducted?**
At a time and place most convenient to you.

**Will the outcomes of the research be published?**
The research will be written up as the researcher’s doctoral thesis. The research may also be published in a scientific journal and your permission will be sought via a consent form to use the data from your interview for this purpose.

**Criminal Records Check**

The researcher has undergone a satisfactory criminal records check and can therefore conduct research on school premises.

**Contact for further information**

If you have any questions about this research the researcher and supervisor of the project can be contacted for further discussion on any aspect of this study.

**Alison Hughes** (researcher):

Address: Doctorate in Educational and Child Psychology, Educational Support and Inclusion (ESI), School of Education, Ellen Wilkinson Building, The University of Manchester, Oxford Road, Manchester, UK, M13 9PL.

Email: Alison.hughes@acornpsychology.co.uk
Telephone: 07860 671 779

**Catherine Kelly** (supervisor):

Address: Address: Doctorate in Educational and Child Psychology, Educational Support and Inclusion (ESI), School of Education, Ellen Wilkinson Building, The University of Manchester, Oxford Road, Manchester, UK, M13 9PL.

Email: Catherine.Kelly@manchester.ac.uk
Telephone: 0161 275 3511 or 3460 (Please leave a message with Jackie Chisnall - Programme Secretary).

**What if something goes wrong?**

You can contact the researcher or supervisor at any point during or after the research if you require assistance with anything related to the research conducted. If there are any issues regarding this research that you would prefer not to discuss with members of the research team, please contact the Research Practice and Governance Co-ordinator by either writing to 'The Research Practice and Governance Co-ordinator, Research Office, Christie Building, The University of Manchester, Oxford Road, Manchester M13 9PL', by emailing: [Research-Governance@manchester.ac.uk](mailto:Research-Governance@manchester.ac.uk), or by telephoning 0161 275 7583 or 275 8093.
APPENDIX G: Consent form.

A case study investigation into the sensory needs of children and young people with Autistic Spectrum Condition (ASC) within an educational context

CONSENT FORM

If you are happy to participate please complete and sign the consent form below

1. I confirm that I have read the attached information sheet on the above study and have had the opportunity to consider the information and ask questions and had these answered satisfactorily.

2. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving a reason.

3. I understand that the interviews will be audio-recorded and transcribed

4. I agree to the use of anonymous quotes

5. I agree that any data collected may be published in anonymous form in academic books or journals.

I agree to take part in the above project

Name of participant __________________________ Date ________________ Signature __________________________

Name of person taking consent __________________________ Date ________________ Signature __________________________
APPENDIX H: RREA ethics form and SoE form.

RESEARCH RISK AND ETHICS ASSESSMENT
School of Education, University of Manchester

The School of Education is committed to developing and supporting the highest standards of research in education and its associated fields. The Research Risk and Ethics Assessment (RREA) resource has been created in order to maintain these high academic standards and associated codes of good research practice. The research portfolio within the School of Education covers a wide range of fields and perspectives. Research within each of these areas places responsibilities of a differing nature on supervisors and students subject to course, level, focus and participants. The aim of the Research Risk and Ethics Assessment is to assist supervisors and students in assessing these factors.

The School has determined three levels of Research Risk each of which has a number of associated criteria and have implications for the degree of ethical review required. In general, the research risk level is considered to be:

- **High**: If the research focuses on groups within society in need of special support, or where it may be non-standard, or if there is a possibility the research may be contentious in one or more ways.
- **Medium**: If the research follows standard procedures and established research methodologies and is considered non-contentious.
- **Low**: If the research is of a routine nature and is considered non-contentious.\(^3\)

Agreement to proceed with research at each of these levels is provided by an appropriate University Research Ethics Committee, a School of Education Research Integrity Committee member, or by the supervisor/tutor respectively.

**How to complete the Research Risk and Ethics Assessment (RREA) form.**

This form should be completed, in consultation with the School of Education Ethical Practice Policy Guidelines\(^4\), by School of Education students and their supervisors in all cases, except where a pre-approved assignment template currently exists\(^5\). There are six main sections to this document, with three additional sections for UG/PGT research (or Prof Doc Research Papers) seeking ethical approval for LOW risk studies from a supervisor/tutor:

**ANY student**

- Section A – Summary of Research Proposal (page 1)
- Section B – Description of Research (page 2)
- Sections C.0-C.1 – Criteria for HIGH risk research (page 4)
- Section C.2 – Criteria for MEDIUM risk research (page 6)
- Section C.3 – Criteria for LOW risk research (page 8)

**Where indicated**

- Section D – LOW risk Fieldwork Declaration (page 9)

**UG/PGT students and Prof Doc students completing Research Papers only**

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3 A reasonable person would agree that the study includes no issues of public or private objection, or of a sensitive nature.
4 [http://www.education.manchester.ac.uk/intranet/ethics/](http://www.education.manchester.ac.uk/intranet/ethics/)
5 For courses with approved templates see: [http://www.education.manchester.ac.uk/intranet/ethics/](http://www.education.manchester.ac.uk/intranet/ethics/)
• Section E.1 – Criteria for LOW risk PGT/UG approval (page 11)

Supervisors and tutor approvals of LOW risk student research

• Section E.2 – Supervisor confirmation that research matches LOW risk criteria (page 12)
• Section E.3 – Minor Amendments to LOW risk study and supervisor approval (page 13)

It may be appropriate for supervisors and students to review and discuss responses to these questions together.

NB: A separate Fieldwork Risk Assessment form must be completed as indicated in this RREA, in order to plan how safety issues will be responded to during fieldwork visits. The Fieldwork Risk Assessment form is available on the School of Education ethics intranet. For all projects where this does not apply, a LOW Risk Fieldwork Declaration (Section D) must be completed. Instructions on this and subsequent stages of the RREA process are provided at the end of each following section.
**SECTION A - SUMMARY OF RESEARCH PROPOSAL**

This section should be completed by the person undertaking the research.

<table>
<thead>
<tr>
<th>A1. Name of Person/Student:</th>
<th>Alison Hughes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2. Student ID (quoted on library/swipe card):</td>
<td>58216031</td>
</tr>
<tr>
<td>A3. Email Address:</td>
<td><a href="mailto:Alliehughes91@hotmail.com">Alliehughes91@hotmail.com</a></td>
</tr>
<tr>
<td>A4. Name of Supervisor:</td>
<td>Catherine Kelly</td>
</tr>
<tr>
<td>A5. Supervisor email address &amp; contact phone no.:</td>
<td><a href="mailto:Catherine.Kelly@manchester.ac.uk">Catherine.Kelly@manchester.ac.uk</a></td>
</tr>
<tr>
<td>A6. Programme (PhD, ProfDoc, MEd, PGCE, MSc, BA etc):</td>
<td>Doctorate in Educational and Child Psychology (D.Ed.Ch.Psych)</td>
</tr>
<tr>
<td>A7. Year of Study</td>
<td>2</td>
</tr>
<tr>
<td>A9. Course Code</td>
<td>EDUCM2141</td>
</tr>
<tr>
<td>A10. Title of Project:</td>
<td>A case study investigation into the sensory needs of children and young people with Autistic Spectrum Condition (ASC) within an educational context</td>
</tr>
<tr>
<td>A11. Participant Recruitment Start Date:</td>
<td>On confirmation of ethical approval</td>
</tr>
<tr>
<td>A13. Proposed Fieldwork Start Date:</td>
<td>May 2013</td>
</tr>
<tr>
<td>A14. Location(s) where the project will be carried out:</td>
<td>North West England</td>
</tr>
<tr>
<td>A15. Student Signature:</td>
<td>[Signature]</td>
</tr>
</tbody>
</table>

242
A15. Assessed Risk Level


A16. Supervisor Signature

C. Kelly

A17. Date

24.03.13

The following section to be completed by the SUPERVISOR

SECTION B – DESCRIPTION OF RESEARCH

This section should be completed by the person undertaking the research.

B1. Provide an outline description of the planned research (250 words max).

A review of the literature highlighted that many children with Autistic Spectrum Condition (ASC) experience unusual responses to sensory stimuli, however a lack of consensus surrounding the operational definition of this construct was identified. The review also highlighted a lack of research that explores how the unusual sensory responses of children with ASC are supported within an educational setting. Therefore, the present researcher identified the need for a qualitative investigation into the sensory needs of children with ASC within educational settings and how these needs are being supported.

The present study’s research questions are as follows:

1. What experiences and conceptualisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?
2. What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?

B2. The principal research methods and methodologies are (250 words max):

The present research will utilise an exploratory single-embedded case study design (Yin, 2009). An individual semi structured interview will be conducted with six professionals (two specialist teachers, two specialist educational psychologists and two occupational therapists) in order to explore in detail their experiences with regards to the unusual sensory responses demonstrated by children with ASC in educational settings. The data collected from the six interviews will be analysed using Braun and Clarke’s (2006) six phase model of thematic analysis. This will allow the researcher to identify, analyse and report themes within the data (Braun and Clarke, 2006) that link specifically to the present study’s research questions.

B3. Please indicate which of the following groups are expected to participate in this research:

[X] Children under 16, other than those in school, youth club, or other accredited organisations.

[ ] Adults with learning difficulties, other than those in familiar, supportive environments.

6 The person with learning difficulties has appropriate support within the setting from accredited support workers or family members.
Adults who are unable to self-consent
Adults with mental illness
Those who could be considered to have a particularly dependent relationship with the researcher
Prisoners
Young Offenders
Other vulnerable groups (please detail)

OR

None of the above groups are involved in this study

B4. Number of expected research participants. 6

B5. The research will take place (tick all that apply):

X within the UK

within the researcher’s home\(^7\) country if outside the UK

wholly or partly outside the UK and not in the home country of the researcher*

* You must also complete a separate Fieldwork Risk Assessment form

\(^7\) The researcher’s ‘home country’ is defined as one in which (1) the researcher holds a current passport through birthright or foreign birth registration, (2) a country where the researcher has resident status, or (3) where the researcher holds a permit or visa to work, has a contract of employment, and is not a UK tax-payer.
SECTION C – RESEARCH RISK ASSESSMENT

The following sections should be completed by the person undertaking the research in discussion with their supervisor/tutor.

C.0 – Criteria for research classified as HIGH RISK – NRES

- The study involves primary research with adults who are unable to self consent
- The study involves primary research with NHS patients
- The study involves primary research with prisoners/young offenders

Students - If any of these options apply, you should complete an NRES application. See your supervisor for further guidance.

Supervisors – Forward this RREA form to ethics.education@manchester.ac.uk when you are satisfied that the project requires an IRAS application.

C.1 – Criteria for research classified as HIGH RISK (tick any that apply)

I/we confirm that this research:

- involves vulnerable or potentially vulnerable individuals or groups as indicated in B3
- addresses themes or issues in respect of participant’s personal experience which may be of a sensitive nature (i.e. the research has the potential to create a degree of discomfort or anxiety amongst one or more participants)
- cannot be completed without data collection or associated activities which place the researcher and/or participants at personal risk*
- requires participant informed consent and/or withdrawal procedures which are not consistent with accepted practice
- addresses an area where access to personal records (e.g. medical), in collaboration with an authorised person, is not possible
- involves primary data collection on an area of public or social objection (e.g. terrorism, paedophilia)
- makes use of video or other images captured by the researcher, and/or research study participants, where the researcher cannot guarantee controlled access to authorised viewing.
- will involve direct contact with participants in countries on the Foreign and Commonwealth Office warning list⁸ *
- involves face to face contact with research participants outside normal working hours⁹ that may be seen as unsocial or inconvenient*
- will take place wholly or partly without training or qualified supervision*

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⁹ For example, in the UK, normal working hours are between 8am-6pm, Mon-Fri inclusive.
requires appropriate vaccinations which are unavailable*

will take place in locations where first aid and/or other medical support or facilities are not available within 30 minutes*

may involve the researcher operating machinery, electrical equipment, or workplace vehicles, or handling or working with animals at the research location(s), for which they are not qualified, and where a qualified operative or handler is not available to act as supervisor.*

* IF YOU HAVE TICKED these HIGH risk criteria you must also complete a separate Fieldwork Risk Assessment form

* IF YOU HAVE ONLY TICKED HIGH risk criteria NOT marked (*) you MUST complete the LOW Risk Fieldwork Declaration on page 9 of this form

A. PGR research
If ONE OR MORE of the HIGH risk criteria have been selected ethical approval must be sought from a UREC committee. The person undertaking the research and their supervisor should agree this risk assessment and submit:

- Completed RREA form
- Completed the UREC form.
- Completed Fieldwork Risk Assessment form where indicated
- Supporting documents

B. PGT/UG research not reviewing/evaluating professional roles or practice
If ONE OR MORE of the HIGH risk criteria have been selected ethical approval must be sought from a UREC committee. The supervisor and person undertaking the research should agree this risk assessment and submit:

- Completed RREA form
- Completed the UREC form.
- Completed Fieldwork Risk Assessment form where indicated
- Supporting documents

C. PGT or UG research reviewing/evaluating professional roles or practice,
If ONE OR MORE of the HIGH risk criteria have been selected ethical approval must be sought from the School of Education (SoE) Research Integrity Committee (RIC). The supervisor and student agree this risk assessment and submit:

- Completed RREA form
- Completed SoE Ethical Approval Application form
- Completed Fieldwork Risk Assessment form where indicated
- Supporting documents.

NB: ‘Supporting documents’ include recruitment adverts/emails, draft questionnaires / interview topic guides, information sheets and consent forms.

The documents listed above should be submitted to:

A. Mrs. Debbie Kubiena, Room B3.10 along with your PhD Research Plan for consideration at the PhD/Prof Doctorate Review Panel.
B. The Quality Assurance Administrator via Ethics.Education@manchester.ac.uk by your supervisor. In doing so, supervisors confirm that they have agreed the assessed risk level and that the documents are complete and correct. The QA Administrator will arrange authorisation for your documents to be submitted to UREC.
C. The Quality Assurance Administrator via Ethics.Education@manchester.ac.uk by your supervisor. In doing so, supervisors confirm that they have agreed the assessed risk level and that the documents are complete and correct. The QA Administrator will forward your completed documents to a member of the SoE RIC committee for approval.

*If no HIGH risk items are ticked supervisors and students should continue to section C.2 on the next page*
C.2 – Criteria for research classified as **MEDIUM RISK** (tick any that apply)

I/we confirm that this research:

- is primary research involving children or other vulnerable groups which involves direct contact with participants\(^{10}\).
- study is on a subject that a reasonable person would agree addresses issues of legitimate interest, where there is a possibility that the topic may result in distress or upset in rare instances.
- is primary research which involves substantial direct contact\(^{11}\) with adults in non-professional roles*
- is primary research which focuses on data collection from professionals responding to questions outside of their professional concerns.
- is primary research involving data collection from participants outside of the EU or the researcher’s home country via direct telephone, video, or other linked communications.
- is practice review/evaluation involving topics of a sensitive nature which are not personal to the participants.
- involves visits to site(s) where a specific risk to participants and/or the researcher has been identified, and the researcher may not be closely supervised throughout*
- requires specific training and this is scheduled to be completed before fieldwork starts, or, training will not be undertaken but the research will be closely supervised by an academic advisor with appropriate qualifications and skills
- requires vaccinations which have been received, or are scheduled to be received in a timely fashion*
- requires face to face contact with research participants partly outside normal working hours\(^{12}\) that may be seen as inconvenient*
- takes place in, or involves transport to and from, locations where the researcher’s lack of familiarity may put them at personal risk*
- may require the operation of machinery, electrical equipment, or workplace vehicles, or handling or working with animals at the research location(s), for which they are not qualified, but such operation or handling will be undertaken under close supervision from a qualified operative or handler*

* IF YOU HAVE TICKED these MEDIUM risk criteria you must also complete a separate Fieldwork Risk Assessment form

** IF YOU HAVE ONLY TICKED MEDIUM risk criteria NOT marked (*) you MUST also complete the LOW Fieldwork Risk Declaration on page 9 of this form

---

\(^{10}\) This does not include research in locations where children are present if they are not the focus of the research.

\(^{11}\) For example in focus group or one to one interview in private locations, and not ‘market research’ which is characterised by brief interaction with randomly selected individuals in public locations.

\(^{12}\) In the UK normal working hours are between 8am-6pm, Mon-Fri inclusive.
If ONE OR MORE of the **MEDIUM risk** criteria have been selected, ethical approval must be sought from the School of Education (SoE) Research Integrity Committee (RIC) and so you should complete the SoE Ethical Approval Application form (available on the School of Education Ethics Intranet).

The supervisor and student should agree this RREA assessment and submit:

- Completed RREA form
- Completed School of Education Ethical Approval Application form
- Completed Fieldwork Risk Assessment form where indicated
- Supporting documents.

**NB:** ‘Supporting documents’ include recruitment adverts/emails, draft questionnaires / interview topic guides, information sheets and consent forms.

**Document should be submitted for review as indicated below:**

A. **PGR Thesis** - Mrs. Debbie Kubiena, Room B3.10 along with your PhD Research Plan for consideration at the PhD/Prof Doctorate Review Panel.

B. **All other cases** - to the Quality Assurance Administrator via Ethics.Education@manchester.ac.uk by your **supervisor.** In doing so, supervisors confirm that they have agreed the assessed risk level and that the documents are complete and correct. The QA Administrator will forward your completed documents to a member of the SoE RIC committee for approval.

*If none of the HIGH or MEDIUM risk criteria have been ticked, supervisors and students should continue to section C3 on the next page* ᴍ
C3 – Criteria for research classified as LOW RISK

C 3.1 Research not involving human participants
I/we confirm that this research (tick as appropriate):

- is not of high nor medium risk to the researcher, in accordance with the criteria provided in sections C.1 and C.2 respectively.
- is Secondary research (i.e. it will use material that has already been published or is in the public domain).
- is Secondary data analysis (i.e. it will involve data from an established data archive).

If you have ticked one of the options in C3.1 above, and C3.2 does not apply, you should now complete section C3.3.

C 3.2 Research involving human participants
I/we confirm that this research (tick as appropriate):

- is not of high nor medium risk to the researcher, or participants, in accordance with the criteria provided in sections C.0, C.1 and C.2 respectively.
- X A reasonable person would agree that the study addresses issues of legitimate interest without being in any way likely to inflame opinion or cause distress14
- X is Practice review (i.e. the research involves data collection from participants on issues relating to the researcher’s professional role, in a setting where the researcher is employed or on a professional placement).
- is Practice evaluation (i.e. the research involves data collection on a student’s professional role, in a setting where the researcher is employed or on a professional placement. The data collected will be used for comparison against national or other targets or standards).
- X is Primary research on professional practice with participants in professional roles conducted in their work setting.
- is Market research (i.e. the research may involve data collection from the general public approached or observed in public locations for the purposes of market investigation).
- is Primary research using a questionnaire completed and returned by participants with no direct contact with the researcher.
- is part of a research methods course and participant groups are limited to peers, colleagues, family members and friends.

C 3.3 Research context
I/we confirm (tick as appropriate):

- the location(s) of the research are not listed on the Foreign and Commonwealth Office warning lists15

14 A reasonable person would agree that the study includes no issues of public or private objection, or of a sensitive nature.
<table>
<thead>
<tr>
<th></th>
<th>the researcher is not in a position to coerce potential participants/secondary data owners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary or practice research involves no vulnerable group (as indicated in question B3).</td>
</tr>
<tr>
<td></td>
<td>Primary or practice research will be conducted in a public space or building (e.g. the high street, the University campus, a school building, etc)</td>
</tr>
</tbody>
</table>

### D. LOW Risk Fieldwork Declaration

**Students not directed to complete the separate Fieldwork Risk Assessment in Section C** should tick the items in D.1 or D.2 to confirm the LOW risk nature of their fieldwork visits. Then sign the Declaration in D.3

**D.1 Fieldwork visit items** (If you will **not make any fieldwork visits**, tick the alternative items in D.2 below.)

I/we confirm:

<table>
<thead>
<tr>
<th></th>
<th>the researcher will not travel outside the UK or their home nation.</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>the fieldwork does not require overnight stays in hotels or other types of public temporary accommodation.</td>
</tr>
<tr>
<td></td>
<td>public and private travel to and from the research location(s) are familiar to the researcher and offer no discernable risk.</td>
</tr>
<tr>
<td></td>
<td>the researcher will not travel through, or work in research locations which may have unlit areas, derelict areas, cliffs, or local endemic diseases</td>
</tr>
<tr>
<td></td>
<td>the researcher will carry only necessary personal items when travelling to, and within, research locations.</td>
</tr>
<tr>
<td></td>
<td>no specific vaccinations are required to undertake this research</td>
</tr>
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<td></td>
<td>first aid provision and a trained first aider are available where appropriate</td>
</tr>
<tr>
<td></td>
<td>the researcher will only operate machinery, electrical equipment, or workplace vehicles, or handle or work with animals at the research location(s) if they are qualified to do so</td>
</tr>
<tr>
<td></td>
<td>the fieldwork will be carried out within normal working hours(^\text{16}) at a time convenient to participants.</td>
</tr>
<tr>
<td></td>
<td>the researcher will not give out personal telephone information to participants, or owners of secondary data resources, in relation to the research project</td>
</tr>
<tr>
<td></td>
<td>the researcher is fully aware of and sensitive to cultural and religious practices of participant groups, and will act accordingly.</td>
</tr>
<tr>
<td></td>
<td>primary or practice research will not involve fieldwork visits to private homes.</td>
</tr>
<tr>
<td></td>
<td>the researcher will provide a regularly updated fieldwork visit schedule to a nominated University contact.</td>
</tr>
<tr>
<td></td>
<td>the researcher will carry a School of Education Emergency Contact Information Card during all fieldwork visits.</td>
</tr>
</tbody>
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\(^{16}\) For example, in the UK normal working hours are between 8am and 6pm Mon-Fri inclusive.
If you are unable to tick all items above, you must complete a separate Fieldwork Risk Assessment form.

D.2 No Fieldwork visits items

I/we confirm:

- this research does not involve fieldwork visits of any kind
- the researcher will not give out personal telephone information to participants, or owners of secondary data resources, in relation to the research project

D.3 Researcher Declaration:

By signing this completed document, I declare that the information in it is accurate to the best of my knowledge and that I will complete any actions that I have indicated I will complete.

Signature: [Signature]

Date: 24.03.13

Name (in capitals): ALISON HUGHES

Student ID: 58216031
PGR Panel Students

If ONE OR MORE of the LOW risk criteria above have been selected, ethical approval must be sought from the School of Education Research Integrity Committee. The supervisor and student should agree this research risk assessment and submit:

- Completed RREA form
- Completed the School of Education Ethical Approval Application form. ¹⁷
- Completed Fieldwork Risk Assessment form where indicated
- Supporting documents

NB: ‘Supporting documents’ include recruitment adverts/emails, draft questionnaires / interview topic guides, information sheets and consent forms.

Documents should be submitted to:

Mrs. Debbie Kubiena, Room B3.10 along with your PhD Research Plan for consideration at the PhD/Prof Doctorate Review Panel.

⇒ **UG and PGT research that involves only low risk criteria go to Section E.1 page 12**

¹⁷ This document and guidance for completion can downloaded from [http://www.education.manchester.ac.uk/intranet/ethics](http://www.education.manchester.ac.uk/intranet/ethics)
### SECTION E – UG/PGT Ethical Approval Application for LOW risk research

Section E.1 to be completed by students. Section E.2 to be completed by supervisors/tutors

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#### E.1 Research ethics criteria

I/we confirm (tick as appropriate):

**Codes of Practice**

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**Researcher skills/checks**

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**Rights of participants**

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**Research Integrity**

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<td></td>
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<td>X</td>
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</tbody>
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254
Research output

X the only publication/output from this research will be the assignment or dissertation unless consent has been obtained from participants for further dissemination
### E.2 Supervisor confirmation that research matches LOW risk criteria above.

When satisfied that the assessment is correct, **supervisors** should complete this section.

For ‘low risk’ research approval relevant **items in bold must be ticked** and one or more of the specific research criteria as appropriate

#### The supervisor confirms:

<p>| | |</p>
<table>
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<tbody>
<tr>
<td>X</td>
<td>The submission has been discussed and agreed with the person(s) undertaking the research.</td>
</tr>
<tr>
<td>X</td>
<td>The student has had appropriate training and has the skills to undertake this study, or has qualified supervision in place.</td>
</tr>
<tr>
<td>X</td>
<td>The research activities outlined in the proposal involve no substantive risks to the student researcher or potential participants.</td>
</tr>
</tbody>
</table>

and one or more of the following as appropriate:

<p>| | |</p>
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<tr>
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<tbody>
<tr>
<td>X</td>
<td>Primary or Practice research will not address issues of public or social objection or of a sensitive nature.</td>
</tr>
<tr>
<td>X</td>
<td>Information giving and consent taking processes follow School of Education guidance.</td>
</tr>
<tr>
<td></td>
<td>Where fieldwork visits do not correspond to all items in the LOW Risk Fieldwork Declaration, a separate Fieldwork Risk Assessment form has been completed and approved.</td>
</tr>
<tr>
<td></td>
<td>Secondary research assignment/project has appropriate resource or database access permissions.</td>
</tr>
<tr>
<td>X</td>
<td>They will act as custodian for data used for any study that results in a publication (Masters dissertation or otherwise) and will arrange for archiving of data within the School for a minimum period of 5 years.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th><strong>Supervisor’s signature:</strong></th>
<th>C. Kelly</th>
<th><strong>Date:</strong></th>
<th>24.03.13</th>
</tr>
</thead>
</table>

**IF all relevant** items in **BOLD** are confirmed and in addition **all specific criteria** relating to primary, practice or secondary research are confirmed as appropriate, **the supervisor should submit:**

- Completed **RREA form**
- Completed **Fieldwork Risk Assessment** form where indicated
- Student research **proposal, or equivalent**, on which the assessment is based
• Supporting documents\textsuperscript{18}

**Documents should be submitted electronically for archiving and audit purposes**, to the Quality Assurance Administrator via [Ethics.Education@manchester.ac.uk](mailto:Ethics.Education@manchester.ac.uk) by the supervisor. In doing so, supervisors confirm that they have agreed the assessed risk level and that the documents are complete and correct. The QA administrator will acknowledge receipt of the documents and provide formal confirmation of ethical approval via email to both student and supervisor. Copies of all documents should be retained by the supervisor.

\textsuperscript{18} ‘Supporting documents’ include recruitment adverts/emails, draft questionnaires/interview topic guides, information sheets and consent forms
E.3 Amendments to proposed research design for LOW risk research

Any minor\(^{19}\) amendment to low risk approved research submissions should be recorded and signed-off by the supervisor as necessary below. Substantial changes to research will require a reassessment and revised ethical approvals. A revised copy of the RREA showing the approved amendments, and any amended supporting documents, should be forwarded electronically to The QA administrator via ethics.education@manchester.ac.uk. The QA administrator will provide formal acknowledgement of approval of the change by email. A copy should be retained by the supervisor.

To be completed if/when applicable:

<table>
<thead>
<tr>
<th>Minor(^{20}) amendment to assessed research agreed (1):</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Details of amendment</strong></td>
</tr>
</tbody>
</table>

This section will record any applications made during the life time of the Project regarding minor changes from what was approved.

<table>
<thead>
<tr>
<th>Supervisor’s signature:</th>
<th>Date:</th>
</tr>
</thead>
</table>

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\(^{19}\) Minor amendments are those that do not alter the character of the research or the participant groups

\(^{20}\) Minor deviations from previously approved research submissions are defined as those which neither change the nature of the study nor deviate from any participatory research groups previously identified. Supervisors should contact a member of the SoE Research Integrity Committee for advice if in doubt.
### School of Education

#### Ethical Approval Application Form

The ethical approval application form must contain answers to **all** the questions indicated in the boxes below, if they do not apply please state why.

**SECTION 1 Student Details /Identification of the person responsible for the research**

<table>
<thead>
<tr>
<th>Name of Student:</th>
<th>Alison Hughes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student ID (quoted on library/swipe card):</td>
<td>58216031</td>
</tr>
<tr>
<td>Email Address:</td>
<td><a href="mailto:Alliehughes91@hotmail.com">Alliehughes91@hotmail.com</a></td>
</tr>
<tr>
<td>Name of Supervisor:</td>
<td>Catherine Kelly</td>
</tr>
<tr>
<td>Programme (PhD, Prof Doc, MED, PGCE, MSc, BA etc):</td>
<td>Doctorate in Educational and Child Psychology (D.Ed.Ch.Psychol)</td>
</tr>
<tr>
<td>Year of Study</td>
<td>2</td>
</tr>
<tr>
<td>Full/Part-time</td>
<td>Full</td>
</tr>
<tr>
<td>Title of Project:</td>
<td>A case study investigation into the sensory needs of children and young people with Autistic Spectrum Condition (ASC) within an educational context</td>
</tr>
<tr>
<td>Project Start and End Dates:</td>
<td>May 2013 - May 2014</td>
</tr>
<tr>
<td>Location(s) where the project will be carried out:</td>
<td>North West England</td>
</tr>
<tr>
<td>No risk, or acceptable levels of risk (measures documented)</td>
<td>Low Risk (RREA form completed)</td>
</tr>
</tbody>
</table>
| Student Signature:       | ![Signature]

**Supervisor Signature:**

| Date:                     | C. Kelly 24.03.13 |

** Supervisor signature confirms that the student has the relevant experience, knowledge and skills to carry out the study in an appropriate manner**
SECTION 2 PROJECT DETAILS (Please expand boxes to fit answers)

2. **Aims and Objectives of the Project**

A. Provide a statement of your research aims and objectives including research questions.

A review of the literature highlighted that many children with Autistic Spectrum Condition (ASC) experience unusual responses to sensory stimuli, however a lack of consensus surrounding the operational definition of this construct was identified. The review also highlighted a lack of research that explores how the unusual sensory responses of children with ASC are supported within an educational setting. Therefore, the present researcher identified the need for a qualitative investigation into the sensory needs of children with ASC within educational settings and how these needs are being supported.

The present study's research questions are as follows:
1. What experiences and conceptualisations do Specialist Teachers, Occupational Therapists and Specialist Educational Psychologists have regarding unusual sensory responses in children with ASC within an educational setting?
2. What are the experiences of these professionals with regards to supporting unusual sensory responses in children with ASC within an educational setting?
3. What do these professionals identify as the barriers and facilitators to supporting unusual sensory responses in children with ASC within an educational setting?

B. What is the justification for the research? (why is it an area of importance/ has any similar research been done)

The present author posits that there will be an original contribution to knowledge following the gathering of data to answer these research questions. Firstly, there is continuing debate between researchers as to the exact nature and classification of unusual responses to sensory stimuli in children with ASC. It is argued that the present investigation will facilitate a broader and richer picture of this construct to be captured. Secondly, the present investigation will add to emerging literature exploring how the sensory needs of children with ASC can be supported in educational settings.

C. What are the main ethical issues and what steps will be taken to address them?

The British Psychological Society’s (2009) ‘Code of Ethics and Conduct’ will be followed by informing participants of the research objectives, obtaining informed consent, emphasizing rights of withdrawal, avoiding deception, proper debriefing, maintaining confidentiality and protecting participants from harm. The researcher’s involvement throughout will be with regard to Professional Practice Guidelines (BPS, 2002) and the Health Professionals Council (HPC) Standards of Conduct, Performance and Ethics (HPC, 2008).

2. **Methodology**
A. Please outline the design and methodology of the project, including the methods of data collection and the methods of data analysis and the theoretical framework that informs it.

Design of the study
The present research will utilise an exploratory single-embedded case study design (Yin, 2009).

Data collection
An individual semi structured interview will be conducted with six professionals (two specialist teachers, two specialist educational psychologists and two occupational therapists) in order to explore in detail their experiences with regards to the unusual sensory responses demonstrated by children with ASC in educational settings.

Data analysis
The data collected from the six interviews will be analysed using Braun and Clarke’s (2006) six phase model of thematic analysis. This will allow the researcher to identify, analyse and report themes within the data (Braun and Clarke, 2006) that link specifically to the present study’s research questions.

Epistemological position
The epistemological position of the research is critical realism (Robson, 2002). Therefore, the present author considers that when investigating the experiences of people, research methods should be employed that allow for engagement with people’s ability to reflect on and provide an account of their own actions. The present author believes this approach to be as justly scientific as those that disregard this capability (Banister, Burman, Parker, Taylor, & Tindall, 1999).

B. A description of the research procedures/activities as they affect the study participant and any other parties involved.

Participants will take part in an individual semi structured interview lasting approximately 45 minutes (see Appendix A).

C. Please state your experience in conducting the research procedures/ activities and provide supporting evidence.

I have conducted interviews with educational professionals for a previous piece of research on my professional doctorate. I have received extensive teaching on research methods as part of my doctorate.

Attach copies of any draft instrument / interview guide / screen prints, and so on.

3. Participants

A. Give the number of participants; sex; age group and location

There will be six participants in total: two specialist teachers, two specialist educational psychologists and two occupational therapists. At this stage in the research the gender, age group (except all participants will over 20 years of age) and location of participants is not known.

B Will your project include participants from any of the following groups? (Tick as appropriate)
- Children under 16
- Adults with learning difficulties
- Adults with mental illness
- Those who could be considered to have a particularly dependent relationship with the researcher
- Prisoners
- Young Offenders
- Other vulnerable groups (please detail)

C. If your project includes vulnerable populations please explain why it is necessary to include them in your study, including measures you will take to avoid coercion.

N/A - no vulnerable populations.

**Recruitment (please append any advertisement you will use)**

A. How will potential participants be:
   i) Identified
   ii) Approached and Recruited

   The research will take an opportunistic approach to sampling in order to recruit two specialist teachers (specialists in ASC), two educational psychologists (specialists in ASC) and two occupational therapists. The present author will use their university and placement supervisors’ knowledge in order to identify potential participants. All potential participants will then be contacted by the present author by phone or email to request their participation in the present research until the desired sample has been achieved.

B. How will your recruitment policy avoid putting any overt or covert pressure on the individual to consent?

Throughout the recruitment process the present researcher will emphasise the voluntary nature of the research and remind participants about their right to withdraw at any point in the research without having to give reason for withdrawal.

C. How long will the participant have to decide whether to take part in the study?

All participants will have at least two weeks to decide whether they would like to take part.

D. State any payment or any other incentive that is being made to any study participant. Specify and state the level of payment to be made and/or the source of the funds/gift/free service to be used and the justification for it.

No payment or other incentive is being made.
5. **Risk and Safeguards**
   
   Please outline any adverse effects or risks for participants
   
   A. What is the potential for adverse effects of a physical nature; risks or hazards, pain, discomfort, distress, or inconvenience, to participants?
   
   There is no potential for adverse effects of a physical nature; risks or hazards, pain, discomfort, distress to participants. There is a low risk that taking part in an interview would be inconvenient for participants.
   
   B. Will any topics discussed (questionnaire, group discussion or individual interview) be sensitive, embarrassing or upsetting, or is it possible that criminal or other disclosures requiring action could take place during the project?
   
   No.
   
   C. What is the potential for adverse effects, risks or hazards, pain, discomfort, distress, or inconvenience, of a physical or psychological nature to you as the researcher?
   
   None.
   
   D. What precautions have been taken to minimise or mitigate the risks identified above in A, B, C?
   
   The risk of inconvenience to participants will be minimised by allowing them to choose the date, time and place of their interview. The present researcher will also be open to rearranging/cancelling interviews if they are causing inconvenience to participants.

6. **Consent**
   
   A. Detail how informed consent/ assent will be obtained.
   
   All participants will read an information sheet and complete a consent form prior to participating (see Appendices B and C).
   
   B. If the participants are to be recruited from a vulnerable groups (3B) give details of the extra steps taken to assure their protection.
   
   N/A

   **Attach draft Information Sheets & Consent Forms for each participant group.**

7. **Data Protection and confidentiality**
   
   A. Will the study use any of the following activities at any stage?
   
   | ✔ | Electronic transfer by email or computer networks |
B. Please provide details on the measures you will employ to comply with the Data Protection Act and the University Data Protection Policy?

Data collected in the present research will be for a specific and limited purpose, will not exceed the purpose for which it was collected, will not be kept longer than necessary, will be protected against unauthorised access, and will not be transferred out of the UK.

C. What measures have been put in place to ensure confidentiality of personal data? Give details of whether any encryption or other anonymisation procedures have been used and at what stage?

Interview recordings will be transferred from the recorder to a laptop as soon as possible post-interview. This laptop is password protected and the audio file will also be password protected. Transcriptions of the interviews will be anonymised and also password protected.

D. Where will the analysis of the data from the study take place and by whom will it be undertaken?

The present researcher will undertake data analysis at their home.

E. Who will have control of and act as the custodian for the data generated by the study?

The research supervisor.

F. Who will have access to the data generated by the study?

The present researcher and supervisor.

G. For how long will data from the study be stored?

Five years.

8) Reporting Arrangements

A. Please confirm that any adverse event will be reported to the Committee
B. How is it intended the results of the study will be reported and disseminated?

(Tick as appropriate)

✓ Peer reviewed scientific journals
   Internal report
   Conference presentation

✓ Thesis/dissertation
✓ Written feedback to research participants
   Presentation to participants or relevant community groups
   Other/none e.g. University Library

C. How will the results of research be made available to research participants and communities from which they are drawn?

Brief written feedback of the findings of the research.

D. What arrangements are in place for monitoring and auditing the conduct of the research?

Close supervision by fieldwork supervisor and university tutor.

E. What are the criteria for electively stopping the research prematurely?


9. Sponsorship

Provide information on whether the study is in receipt of any external funding. Confirm who will act as sponsor of the research.

None.

10. Conflict of Interest

Have any conflicts of interest been identified in relation to this project?

No.
SECTION 3 - MINOR AMENDMENT TO RESEARCH PROJECT

**Application for Approval of Minor Amendment**\(^\text{21}\) to a Research Study

*Details of proposed amendment (please give as much detail as possible)*

<table>
<thead>
<tr>
<th>Supervisor’s signature*</th>
<th>Date.</th>
</tr>
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</table>

**Supervisor Declaration**

I agree that the amendment proposed does not change the character of this research or the participant groups.

I confirm that the research risk assessment for the study as MEDIUM remains.

Please send applications for amendment to ethical approval for MEDIUM risk research to the School Quality Assurance Administrator at ethics.education@manchester.ac.uk who will pass on the request to the RIC member who authorised the original application wherever possible.

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\(^{21}\) Minor amendments are those that do not alter the character of the research or the participant groups
APPENDIX I: Ethics approval email.

Received 19/06/2013

**Ethics Approval Application - CONFIRMATION after Panel**

Ref: PGR-58216031-A1

I am pleased to confirm that your ethics application has now been approved by the School Research Integrity Committee (RIC) against a pre-approved UREC template.

If anything untoward happens during your research then please ensure you make your supervisor aware who can then raise it with the RIC on your behalf.

**This approval is only for the Ethical Approval Application, you are still required to have received approval from your Panel before carrying out any research.**

Regards

Gail

Gail Divall | PGT & Quality Assurance Administrator | Room B3.8 | School of Education | Ellen Wilkinson Building | The University of Manchester | Oxford Road | Manchester | M13 9PL

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