INVESTIGATING THE IMPACT OF AN ADULT INTERACTIVE STYLE INTERVENTION ON THE SPONTANEOUS COMMUNICATION OF THREE STUDENTS WITH AUTISM AND SEVERE LEARNING DIFFICULTIES

by

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ABSTRACT

RATIONALE: Enabling spontaneous communication has been identified as a key goal in the education of students with autism. Autistic young people with severe learning difficulties are an under-researched group and there is a gap in curricular and pedagogical guidance and training for staff working in special schools. Educational psychologists could have a greater role in addressing this. Therefore, this study sought to investigate the impact of an Adult Interactive Style Intervention (Kossyvaki, 2017) on the spontaneous communication of three young people with autism and severe learning difficulties, with a view to broadening the offer of educational psychology services.

INTERVENTION PROCEDURE: Staff were videoed naturally interacting with the students. The video was edited and shared during group training sessions to highlight strengths and good practice, illustrating 13 general principles and 8 communicative opportunities distilled from the autism intervention literature. Staff trialled the strategies over several weeks, were facilitated to reflect on them, and decided to implement 6 of the communicative opportunities from the original study. These were incorporated into the students' daily routine as often as possible for 5 weeks. Supervision sessions were held half way through the strategy implementation phase.

METHODOLOGY: The project is founded on a critical realist philosophical position and used an action research methodology to produce a nested case study. Data was collected using a mixed methods approach, including video observation of the students pre and post intervention, semi structured interviews with staff post intervention, a self-report check in questionnaire completed by staff regarding their use of the communicative opportunities, and contextual information was recorded in the researcher's diary.

FINDINGS: The spontaneous communication of two students improved (implementation of the principles and data collection was limited for the third child). A range of factors impacting the intervention were identified at the student, staff, process and school level, and used to inform implications for future research and educational psychology practice.

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Thank you to Dr Anita Soni, Dr Lila Kossyvaki and Dr Olivia Corradi-Remi for their support and guidance during the completion of this project. Thank you to my course cohort and the friends I have made over the last three years. Thank you, of course, to my husband and three children who have been so patient while mummy writes her 'big essay'. Thank you to the students and school staff who took part in this intervention study. This thesis is dedicated to the skilled professionals who work in our specialist settings.

> Usually, Theresa begins by singing the Hello song softly, gradually singing it louder and louder, building up the crescendo, moving closer into Rachel, until she gets to the last line. When she sings the last few words, - 'Hello Rachel, how are ...' - Theresa leans in and tickles Rachel as she sings 'You!' They both end up in a hug and Rachel squirms with delight, vocalising loudly. This time, however, Theresa is changing the routine slightly, extending it by expecting Rachel to use her vocalisation to express 'more' and learn more about contingency awareness and intentional communication. Theresa sings the song, but this time she pauses longer before singing the last word 'You', creating a gap in the 'dialogue', expecting Rachel to fill in the gap with her vocalisation. Theresa wants Rachel to take her turn in the dialogue and use her vocalisation to express 'more'. Then, Rachel will receive the tickle and hug in the usual way. Pausing the interaction in this way is only a small modification of the activity, but developmentally in terms of Rachel's learning, it is monumental.
>
> (Hinchcliffe, 2022, p. 76)

CONTENTS

LIST OF ABBREVIATIONS

ASD:	Autism Spectrum Disorder
BPS:	British Psychological Society
BST:	Behavioural Skills Training
EP:	Educational Psychologist
MAPP:	Mapping and Assessing Personal Progress
PMLD:	Profound and Multiple Learning Difficulties
RQ:	Research Question
SCERTS:	Social Communication, Emotional Regulation and Transactional Support
SCRUFFY:	Student-led, Creative, Relevant, Unspecified, Fun, For, Youngsters (targets)
SEND:	Special Educational Needs and Disabilities
SLD:	Severe Learning Difficulties
SMART:	Specific, Measurable, Achievable, Realistic, Timebound (targets)
TEP:	Trainee Educational Psychologist
UPIAS:	The Union of the Physically Impaired Against Segregation
VERP:	Video Enhanced Reflective Practice
VIG:	Video Interaction Guidance

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CHAPTER 1: INTRODUCTION

This chapter introduces the context and background in which I decided to undertake this project, including key personal, professional, and theoretical influences that have determined my approach and positionality as a researcher. This chapter then outlines decisions I have taken in my use of language and terminology and presents an overview of the thesis.

1.1 Context

This research forms Volume 1 of a two- volume thesis for the Applied Educational and Child Psychology Doctoral Programme at the University of Birmingham. It was completed during the second and third years of the programme, while being on placement as a Trainee Educational Psychologist (TEP) in a Midlands Local Authority.

1.2 Background

During my first year of training, I was inspired by the work of Dr Lila Kossyvaki, Associate Professor in Severe, Profound and Multiple Learning Disabilities, at the University of Birmingham. Her doctoral thesis explored the components of an adult interactive style that enables spontaneous communication in young children with autism and learning disabilities. Kossyvaki (2017) conducted an extensive review of the intervention literature to synthesise a set of 13 general principles and 8 communicative opportunities relating to adult interactive style, which she named AISI (Adult Interactive Style Intervention). She then trained staff to implement these and measured the impact. A key component of Kossyvaki's work, that draws on the principles of organisational psychology, is emphasising the importance of collaboration with staff, enacted through an action research methodology. Both the content and process of Kossyvaki's work holds relevance for the profession of educational psychology. By implementing my own participatory research design, with older students, I hoped to add to the knowledge base of the profession and further bridge the gap between academic research and practice.

1.3 Influences

My personal and professional experiences, as well as theoretical influences and reading have shaped my decisions and interpretations throughout this project.

1.3.1 Personal Influences

My brother was diagnosed as 'profoundly mentally and physically disabled' aged two, and he attended a special school setting. His school days were enjoyable and a positive experience for my family but his transition to adulthood and supported living has been more challenging. Enabling and teaching young people with severe or profound learning difficulties to make their needs known to others holds personal significance for me. Additionally, it was never a specific intervention or discrete activity that made a difference for my brother at school, but the daily interactions he has with certain people around him, who tuned into his communication needs and patterns, whilst challenging him to achieve greater communicative independence.

1.3.2 Professional Influences

On entering training in educational psychology, it took me some time to understand my role and how this might compare to popular perceptions of it, as well as how it is defined within the profession - both of which coexist within the context of the special educational needs and disabilities (SEND) system. In my experience, schools tend to hold a perception of the educational psychologist (EP) as an expert in SEND knowledge, whereas the British Psychological Society training and professional standards (BPS, 2019) prioritise expertise in psychological process skills, such as consultation. For me, this is can lead to differing hopes for involvement which comes to the fore when supporting students attending special schools. Additionally, conversations with colleagues suggest that special schools do not buy into EP services as readily as mainstream schools, and the literature available paints a similar picture. Therefore, I am motivated to find ways in which the profession can make a greater contribution to support this group of learners.

1.3.3 Theoretical Influences

Two key theoretical frameworks underpin this study, the interactionist model of disability and the transactional model of child development. As a philosophy and psychology graduate with an interest in disability studies, I have found the work of Tom Shakespeare influential, particularly his book Disability Rights and Wrongs (Shakespeare, 2014).

1.3.3.1 The Transactional Model of Child Development

The key principle of the transactional model is that adult behaviour influences and shapes child development. It has its roots in the socio-cultural theory of Bruner and Vygotsky, whereby communication develops through a continuous dynamic interplay between the adult and child. Prizant et al.'s (2006) Social Communication, Emotional Regulation and Transactional Support Model (SCERTS) made explicit the responsibility adults have for developing the communication skills of children with autism through their interactions with them. This study aims to operationalise an element of transactional support through the implementation of an Adult Interactive Style Intervention.

1.3.3.2 An Interactionist Model of Disability

Several interactionist models of disability have been developed, such as the biopsychosocial model (World Health Organisation, 2007), social-relational model (Reindal, 2008), and a critical realist informed model (Shakespeare, 2014), the latter of which underpins this study. Shakespeare's (2014) position developed from his own experience of achondroplasia, his work as a social scientist and bioethicist, and his argument that neither the medical nor social model of disability aptly captures the experience of disability.

The medical model adopts a reductionist understanding, equating disability with impairment requiring 'cure' or 'treatment', propagating discrimination and exclusionary practices. The medical model is still prevalent in society and academic literature on autism (Llaneza, 2010) although many individuals with autism strongly disagree with this way of conceptualising their experience (Kossyvaki, 2017).

The social model of disability was developed in response to the medical model. The Union of the Physically Impaired Against Segregation (UPIAS, 1976) established principles that informed the social model of disability, showing that people with impairments are disabled by society. The social model of disability presented an emancipatory framework, promoting equality, participation and inclusion. It was, and very much still is, pivotal in the disability rights movement, fueling political and legislative change (Disability Discrimination Act 2005; Equality Act 2010).

An interactionist model of disability is based on the premise that disability is best understood as an interaction between contextual and within person factors, producing a holistic multifactorial account, that could include the nature and severity of impairment, personality, the attitudes of others, environment, policy and culture (Shakespeare, 2014). This provides an appropriate theoretical foundation for an intervention that seeks to develop a communication enabling environment for three young people who learn and experience the world differently to their peers.

1.4 Terminology

This study is conducted in a special school setting, with students who have an identification of Autism Spectrum Disorder (ASD) and Severe Learning Difficulties (SLD). ASD is a neurodevelopmental condition that describes a spectrum of social communication deficits (Lord et al., 2018). Diagnostic criteria stipulate persistent difficulties with social communication and social interaction and restricted and repetitive patterns of behaviour, activities or interests, including sensory behaviours, that have been present since early childhood and limit everyday functioning (APA, 2013). Discussion and disagreement around the definition and boundaries of SLD is extensive (Imray & Hinchcliffe, 2014) but, in short, refers to students with significant learning and cognition needs. The students in this study are either nonverbal or minimally verbal (Koegel et al., 2020) and require a high level of support in all areas of development, including self-help skills.

As detailed later, this research is founded on a critical realist theory of knowledge and rejects a medical model understanding of autism. Language describes but also creates social reality and care should be taken to avoid deficit-based terminology. Terminology used to refer to autism and autistic people should prioritise the preferences of autistic people themselves but, like much autism research (den Houting et al., 2021), this study was conducted without input from the autistic young people involved. Therefore,

guidance was sought from the school, and from survey data collected by researchers and autistic advocates (Bottema-Beutel et al, 2021; Monk et al, 2022).

In this study, 'autism' is preferred to 'Autism Spectrum Disorder' or 'ASD' to avoid unnecessary medicalisation. Identity first language ('autistic student') is interchanged with person first language ('student with autism'). Although current surveys suggest that identity first language is preferred, this is not unanimous, and to completely avoid person first language would not represent the breadth of preferences (Vivanti, 2020). Additionally, the participants' identity as 'students' within this project is important but may also be interchanged with 'child' or 'young person'. 'Complex needs' was considered as alternative terminology to 'severe learning difficulties,' however 'severe learning difficulties' was chosen as it provides greater clarity, more accurately captures the students' needs, and is most likely to be identifiable by other researchers and professionals in the field. The term 'special school' is adopted over 'specialist school' as this is how the setting described themselves. When discussing other relevant studies and documents, the terminology used by the authors being referred to is adopted.

1.5 Structure of the thesis

Chapter 2 presents a review of relevant literature, discussing educational psychology practice in special schools, spontaneous communication in autism, and the intervention literature relevant to this Adult Interactive Style Intervention. Chapter 2 concludes with a rationale for the study and the research questions. Chapter 3 details the methodology of the study and explains decisions made regarding the presentation of findings. Chapter 4 presents and discusses the findings, beginning with student outcomes and student level factors that impacted outcomes, followed by staff views regarding the implementation of intervention strategies as well as staff level factors that impacted implementation, finishing with process and school level factors that also impacted the success of the intervention. A summary is given in relation to the research aim of investigating how the spontaneous communication of three young people with autism and SLD is impacted by this Adult Interactive Style Intervention. Chapter 5 considers implications for educational psychology practice, future research directions, the limitations of the study and concludes the thesis.

CHAPTER 2: LITERATURE REVIEW

The first section of this literature review focuses on the role of educational psychology in special schools, concluding that there is further work to be done (Winter & Bunn, 2019) should EPs hope to offer effective support. This study investigates whether EPs could offer an Adult Interactive Style Intervention (Kossyvaki, 2017) in special school settings to improve the spontaneous communication of students. Therefore, the second section of this literature review outlines theory and research around understanding autism and communication needs, specifically spontaneous communication. The third section of this literature review focuses on interventions that enable spontaneous communication in autistic students, with a particular focus on the concept of adult interactive style. Lastly, conclusions from a review of the literature are summarised to present a rationale for this study, including the research aim and questions.

2.1 Educational Psychology and Special Schools

The socio-political context surrounding the education of students with severe learning difficulties has changed significantly, and for the better, over the last 50 years. However, although the principle of inclusive practice is valued unanimously, its implementation in policy and practice has been confused. Arguably, when narrative shifted towards equality of opportunity, something may have been lost in terms of equity, particularly in relation to specialist teaching skills and staff training. This leads me to consider the role and contribution of educational psychology in special schools, as well as barriers to this.

2.1.1 Education for students with severe learning difficulties

Students with severe learning difficulties were considered 'ineducable,' until the Handicapped Children's Act (1971) secured all children the right to an education. Students were assigned to one of ten categories of handicap, which determined where and how they were taught. These categories were abolished by the Education Act (1981), following the Warnock (1978) committee's recommendations. The principle of inclusive education was cemented internationally in the 'Salamanca Statement' or UN Statement on Special Needs Education (UNESCO, 1994) and the UN Convention on the Rights of Persons with Disabilities (UN, 2006).

Successive British governments declared their commitment to the principles outlined in the Salamanca Statement but the implementation of these principles lacked clarity, direction and funding. For example, New Labour pledged to adopt a policy of inclusive education through their green paper (DfEE, 1997), but distanced themselves from the issue when they came under criticism for the closure of special schools (The House of Commons Education and Skills Committee Report, 2006). Subsequently, David Cameron (Conservative Party, 2010) pledged to call a moratorium on the ideologically driven closure of special schools, strengthening the parental right to choose through the Children and Families Act (2014), whilst simultaneously pursuing an economic policy of national austerity and budget cuts. More recently, insufficient capacity in special schools (DfE, 2022) and increased economic uncertainty has led to systems in need of reform (Ofsted, 2022a). The government's suggestion of an integrated role for alternative provision highlighted in the recent SEND review (DfE, 2022) appears, in part, to be plugging this gap. In my experience, ad hoc resourced provisions in primary settings are increasing and these can effectively meet the needs of young children with autism and SLD *when* they are adequately staffed and resourced. In summary, inclusive practice, as a principle, is valued unanimously, but its real-world implementation has been complex.

2.1.2 National guidance and training for staff

Arguably, one unhelpful outcome of what has been described as a values-led agenda, or a principled rather than evidence- based approach to inclusive practice (Bøttcher & Dammeyer, 2016; Dell' Anna et al. 2021; Lindsay, 2007; Kauffman et al., 2021), is a void in pedagogical and curricular guidance, as well as training, for staff who teach and support students in special schools. This has been reported in a British context (Imray & Hinchcliffe, 2014), but is not unique to Britain (Moljord, 2021).

When the National Curriculum (DfE, 1989) was established, it was intended to promote equal opportunity to a broad and balanced curriculum for all, but in effect, it left children with severe, complex and enduring needs 'working toward Level 1' for the entirety of their education (Gale & Gibbs, 2009). Imray and Hinchcliffe (2014) state that a universal pedagogy and curriculum is unlikely to be an appropriate starting point for students with SLD or Profound and Multiple Learning Difficulties (PMLD):

> Those with SLD and PMLD both deserve and need distinct and separate pedagogies, which in turn drive and inform distinct and separate curricula…those with SLD and PMLD learn in fundamentally different ways from neurotypical children, and we must therefore teach them in fundamentally different ways. (p.24)

Subsequent guidance recognised this oversight to some degree. The P scales (DfE, 2017) were introduced in 1999, and following the Rochford Review (DfE, 2016) have been replaced by the engagement model (DfE, 2020) and pre-key stage 1 and 2 standards (DfE, 2018a, 2018b). However, the primary purpose of these documents is for assessment and school accountability. The engagement model (DfE, 2020) is considered preferable to P-scales in this regard. It gives schools greater impetus to personalise their curricula to meet the students' individual needs, whereas previously, there was a concern that P scale outcomes alone were informing the focus of curricular planning (Hinchcliffe, 2022). However, although the engagement model (DfE, 2020) encourages school staff to closely observe student's levels of attention, interest and involvement, and to use this assessment to gauge the quality of teaching, Hinchcliffe (2022) argues that there is still insufficient reference in the guidance as to how staff can use this information to facilitate learning through appropriate pedagogy and curriculum. Furthermore, functional skills that safeguard future inclusion and dignity, such as using the toilet, are not referred to in documentation (Gale & Gibbs, 2009) even though the life skills and self- determination of students is often raised as a priority for parents during annual review meetings (Bason et al., 2020).

When schools for students with SLD and PMLD were first established, extensive work was undertaken to develop specialist training courses (Gale & Gibbs, 2009). The importance of specialist teacher training was reiterated in the Warnock Report (Warnock, 1978) and the ASCET report (Advisory Committee on the Support and Education of Teachers, 1984), but access to this reduced as policy shifted towards mainstream inclusion. At the turn of the century, Aird (2000, p.107), a special school headteacher and DfE advisor, expressed concern that "since the demise of initial specialist training for teachers of children with SLD/PMLD early in the last decade, I believe that there has been an erosion of specialist knowledge, understanding and skills within staff employed in SLD schools," a concern expressed by educators across the sector (Julian & Ware, 1998; Male & Raynor, 2009; Mittler, 1993). Currently, there are still no specialist initial teacher training routes, and only a small number of post- graduate courses in education for students with severe disabilities nationally (Rees, 2017).

Furthermore, students with SLD are routinely supported by teaching assistants, who play a central role in their education. Ample literature can be found regarding teaching assistant support for students in mainstream schools (Alborz et al., 2009; Farrell et al., 2010; Giangreco, 2010; Fisher & Pleasants, 2012; Sharples et al., 2015; Webster et al., 2011), with far less research and analysis addressing the effectiveness of teaching assistant support for students attending special schools. Small-scale qualitative studies suggest that teaching assistants working in special school settings report a need for improved training (Martin & Alborz, 2014; Simmons & Bayliss, 2007).

Martin and Alborz (2014) explored the views of seventeen teaching assistants and five teachers, from the same special school, regarding the extent to which training equipped teaching assistants to support their students. Staff reported that much of the training, including that accessed within the National Qualifications and Credit Framework, was considered inadequate or irrelevant. Teaching assistants highlighted supporting communication and managing students' behaviour as key priorities for them, for which they felt under-prepared. Within this school, senior leaders expected teachers to provide teaching assistants with ongoing guidance and training, but this did not take place routinely due to staff sickness and unforeseen incidents requiring additional adult capacity. However, this study only represents views gathered in one school. Interestingly, more recent UK- based studies exploring this topic from the perspective of school staff could not be found. However, similar views have been expressed by special educators in the United States (US), particularly regarding inadequate training and preparation time, (Andzik et al., 2019; Brock, 2020; Coogle et al., 2022).

In summary, the literature suggests that from the perspective of special school teachers and teaching assistants, special school leadership, EPs and policy advisors, there is a gap in national guidance and training for staff supporting students with SLD.

2.1.3 The role and contribution of educational psychology in special schools

The marketisation of educational psychology services offers special schools the option to commission EP support, providing an opportunity for the educational psychology profession to respond to the concerns outlined above. This would be in line with government publications that mention a specific role for EPs in working with students who have severe and complex needs (Farrell et al., 2006). Recent educational psychology workforce reports published by the Department for Education that state that "EPs play an

essential role in upskilling the education and wider workforce, thus ensuring high quality special educational needs and disability provision" (Lyonette et al., 2019, p.9) and that "EPs work in education settings, including special schools… to support the most vulnerable children and young people, and those with the most complex needs" (Atfield et al., 2023, p.14).

Previous research that addresses the contribution educational psychology services make in special school settings is scarce. Studies are outdated, conducted prior to the Children and Families Act (2014) and the move to traded services (Male & Raynor, 2009). Additionally, some studies collect data about the EP role from special schools but do not extrapolate this from the data collected from mainstream schools (Kelly & Gray, 2000); others are conducted outside the UK education system, lacking relevance to the current study (Gillman & Gabriel, 2004; Gillman & Medway, 2007; Strogiolis, 2011).

A notable exception is a study conducted by Winter and Bunn (2019) who completed a survey of EPs' contribution to special schools. They focused on EP work in schools that cater for students with PMLD, but these schools are likely to also support students with SLD. An online survey was distributed to all educational psychology services in England and to private practices, with 207 respondents. Data was analysed using descriptive statistics and quantitative and qualitative content analysis. The sample was self- selecting, which may have resulted in EPs with a particular interest in or experience of working in special schools being more likely to respond. Nonetheless, it provides some useful insight into the current working practices of EPs in special schools.

The findings show that work carried out is skewed towards individual, statutory-led cases, although 46.9% of respondents also reported delivering training, and 36.7% reported opportunities to be involved in systemic work. Individual level work, including assessment and consultation can upskill and support staff, for example by sharing knowledge around attachment, metacognition and detailed functional analysis (Winter & Bunn, 2019). However, Winter and Bunn (2019) conclude that training presents the most effective way for EPs to disseminate psychological knowledge as well as knowledge about a wide variety of specific disabilities.

This is echoed by others in the profession. Rees (2017) suggests that further input and training by EPs in special schools may include improving teacher knowledge of specific aetiologies to inform environmental modifications and pedagogy. Some EPs in Winter and Bunn's (2019) survey reported

incorporating Video Interaction Guidance (VIG), Video Enhanced Reflective Practice (VERP), coaching and reflective groups in the training they deliver. Hampton et al. (2019) found numerous benefits to running VERP sessions alongside training on the engagement model for both staff and students, including improved relationships, subtle changes in practice, informed target setting and improved professional confidence.

Details regarding the systemic opportunities EPs report involvement with was not included in Winter and Bunn's (2019) analysis. However, there is recent evidence in the educational psychology literature of both curriculum development (Carpenter et al., 2023; Rees et al., 2017), potential contribution to wider policy development (Hill et al., 2016) as well as whole school development through enquiry and participatory research (Carpenter et al., 2023; Crombie et al., 2014; Hampton et al., 2019).

Carpenter et al. (2023) facilitated a support group to address challenges around the introduction of statutory relationships and sex education (RSE) for students in a special school setting. The support group was developed using Planning Alternative Tomorrow's with Hope (PATH), a participatory, person-centered tool. They concluded that the study demonstrates a key role for EPs, working alongside schools to use PATH to enact cyclical, holistic and reflective approaches to systemic change for sensitive issues such as RSE and other burgeoning educational agendas by working alongside schools to change 'hearts and minds.' However, the article suggests that, due to the sensitivity of the topic and challenges recruiting, staff participants and parent respondents were limited to those who had a relationship with the researcher and whose values and interests already aligned with the research. Therefore, the study is unlikely to capture the depth and complexity of stakeholder views.

Rees et al. (2017) provided pedagogical and curricular guidance to special school settings in a Scottish authority, through their development of the South Lanarkshire Framework for supporting pupils with severe and profound learning difficulties. It was reported to be well received by staff who shared that it developed their mindset, practice and informed target setting for their students. Qualitative data collected triangulated with quantitative data collected to give confidence in the findings. However, one of the authors was also the creator of the framework, increasing the chances of confirmatory bias.

Hill et al. (2016) developed techniques to elicit the views of children in residential special schools, including those with SLD and PMLD, commissioned by the Children's Commissioner for England, a body

able to influence policy makers. They used participatory principles to pilot a method for gaining the views of students that integrated ethnographic observation techniques with checklists adopted from the SCERTS framework (Prizant et. al, 2006). The authors report initial findings to be positive but that the study was constrained by time restrictions. Therefore, the broader strategic impact of this study is unclear.

Crombie at al. (2014) focused on identifying the implicit, experiential knowledge or unnoticed and unconscious good practice of special school staff through a case study design that drew on participatory research principles. The research was conducted over three years in a school for students aged 2 - 19 with SLD and PMLD and included qualitative observation as well as interview data from staff and parents. This study recognised the substantial level of knowledge accumulated by staff in special schools through experience and 'on the job' learning, seeking to make this explicit and to build on it. Strengths in staff included sensitivity to needs and preferences, affirmation of the children's achievements, and total engagement with children in activities they were undertaking. Empathy was found to be at the heart of good practice, and reflection the key to professional development. Although the lead researcher was employed privately as an EP for the school, raising a possible bias in reporting, this in-depth case study gathered views across the whole school community, giving confidence in the findings.

In summary, government publications and literature from within the profession suggest that, alongside the good practice and rich professional knowledge base accumulated within special schools, EPs are in a strong position to contribute to the professional development of staff who teach and care for students with severe or profound learning difficulties.

2.1.4 Barriers to educational psychology involvement in special schools

The previous sections suggest that stakeholders express concern about a gap in national guidance and training for staff teaching students with SLD or PMLD, and that EPs may be able to contribute their knowledge and skills to address this to some degree. However, the most recent snapshot of EP involvement in special schools (Winter & Bunn, 2019) indicates large variations in involvement, reduced contact nationally, with qualitative data suggesting that EPs are not being commissioned by special schools.

One barrier to greater involvement, highlighted by EPs, centers around school budget constraints within the context of traded services (Winter & Bunn, 2019). Furthermore, in many local authorities, the current financial context makes it difficult for EPs to think and work creatively beyond the statutory work they are required to complete to strict deadlines (Hampton et al., 2019). However, this barrier exists across all schools (Lee & Woods, 2017; Gibbs & Lauchlan, 2015); it is not unique to special schools.

A second barrier is alluded to by Rees (2017) who makes a conceptual link between the social model of disability, the inclusion agenda in education, and the impact this has had on EP practice - leading to reduced knowledge around specific disabilities. Winter and Bunn (2019) also identified this as a key barrier to EP involvement in special schools, with EPs consistently reporting limited knowledge, experience and poor confidence. Recent studies conducted by EPs in special schools tend to draw on the profession's process- based knowledge rather than content- based knowledge (Bason et al., 2020; Carpenter et al., 2023; Crombie et al., 2014; Rae et al., 2017), a trend that aligns with Winter and Bunn's (2019) survey. Whereas, the little data available, suggests that special schools do not see a facilitatory EP role as valuable (Rae et al., 2017) and believe that their own staff have more specialist knowledge than individual EPs about specific disabilities (Kelly & Gray, 2000; Winter & Bunn, 2019). It should be noted that this largely reflects what EPs report school staff believe, rather than a direct and comprehensive investigation of staff views. Nonetheless, the available literature suggests that EPs generally do not possess the knowledge special school staff expect them to.

Gale and Gibbs (2009) ask the important question of how the social constructionist approach, underpinning current EP training and practice, should be balanced against the potential danger arising from the ignorance of condition specific risks. The reconstruction of educational psychology (Gillham, 1978), including the opposition to labelling and allegiance with an ecological approach, was an important development for the profession, but it appears to have created a context in which specialist knowledge about specific conditions is not a priority for initial training courses (BPS, 2019). These misaligned perspectives are hypothesised to lead to differing expectations between EPs and special schools regarding their role, acting as a barrier to further involvement.

In summary, EPs' views on their role in special schools "feature limited ideas" (Winter & Bunn, 2019, p.1) and although, as described in the previous section, innovative work has been published in recent years, the literature highlights barriers to further progress. This has led EPs in the profession, with an

interest in the field, to conclude that there is “work to be done” (Winter & Bunn, 2019, p.1), as despite the challenges, taking a risk and being creative can be rewarding for both school communities, as well as EPs themselves (Hampton et al., 2019).

2.2 Spontaneous Communication and Autism

In this section, theories relating to language acquisition and theories relating to why autistic individuals find communication challenging are first summarised. Then the definition of communication adopted in this study is discussed in relation to the unique profiles and language systems developed by autistic students with SLD. Lastly the concept of communicative spontaneity in autism is explored, and its measurement in this study is defined.

2.2.1 Theories of language acquisition

Various theories of language development have been proposed. Behavioural explanations (Skinner, 1957; Mowrer, 1960; Osgood, 1962) consider environmental variables as a key determiner of language development; biological theories (Lenneberg, 1967) argue that environmental variables such as reinforcement are a poor explanation of the phenomenon and language is genetically programmed; cognitive theories (Piaget, 1926) align language development with cognitive development; psycholinguistic theories (Chomsky, 1957) suggest children have innate knowledge of the structures of language; and pragmatic (Bates, 1976) or social interactive (Duchan, 1984) theories emphasise the importance of social experience in language acquisition. These theories have their advantages and disadvantages but any credible conceptualisation will need to emphasise the active role of both the child and the environment in the acquisition of language, as described in the transactional model of child development and interactionist model of disability.

2.2.2 Theories for communication difficulties in autism

Reasons for why autistic individuals find communication challenging are equally numerous and independently incomplete, initially encapsulated in three well-known theories: theory of mind, executive functioning and central coherence. Additionally, Bogdashina (2022) draws particular attention to the role of sensory processing differences.

Difficulties with theory of mind (Baron-Cohen, 1995) can mean that children with autism do not easily attribute mental states such as thoughts, emotions, beliefs and desires to themselves and others, impacting their motivation to communicate. Difficulties with executive functioning (Hill, 2004) including planning and sequencing, working memory, impulse control and mental flexibility limit the self-awareness and processing speed needed for communication (Kossyvaki, 2017). Weak central coherence (Frith, 2003) describes the autistic person's tendency to process information locally, rather than globally and in context. Although the potential for intense and narrow focus is a known strength in autistic students, like a torch beam (Mesibov et al., 2015), children with autism may find it difficult to keep in mind many pieces of fragmented information, only use one sensory channel at a time (Lawson, 2011), fail to notice language unless it interests them, and find attention-switching to a communicative partner difficult (Courchesne et al, 1994). Williams (1994, p.3), an autistic woman, described this as a "busy department store that can open only one department at a time."

Additionally, sensory processing differences can be a key barrier to language acquisition (Bogdashina, 2022). To understand the experience of a child who is learning to communicate, recognising their unique hyper and hypo sensitivities prior to intervention is paramount (Dunn et al., 2002). This is an area of recent interest (Kojovic et al., 2019; Thye et al., 2018), and particularly relevant to naturalistic environments (Haskins et al., 2022), such as busy schools.

2.2.3 Understanding communication and the unique child

Whilst communication difficulties are a core feature of autism, there is significant variation in the communicative profiles of individual students (Clifford et al., 2010), and adults need to be sensitive to the strengths and needs of each child (Kossyvaki, 2017). To clarify how communication is understood in the current study, and its variation in students, we need to define what is meant by communication. Bogdashina (2022, p.19) identifies the following elements as necessary for successful communication:

- A sender and a receiver
- Communicative intent
- A medium of transmission
- Something to communicate about

Communication includes both the transmission and understanding of information, or the expressive and receptive skills of an individual. In this project the students are the 'sender' of information, and the adults around them are the receivers. The target of the intervention is to develop the students' expressive, rather than receptive, language skills.

Numerous definitions of communicative intent are provided in the literature, but none is likely to be operationally effective or accurate for the students taking part in this study. Ogletree et al. (2002) broadly define communication as unintentional, pre-intentional and intentional. However, it is challenging to accurately attribute the level of intentionality to the actions of early communicators (Messer, 1994), in the same way that it is challenging to accurately attribute the level of intentionality to a baby crying. Wetherby and Prizant (1989, cited in Potter & Whittaker, 2001) and Grove et al. (2000) highlight behaviours to look for in students with significant needs that indicate intentionality; these include, altering eye gaze between the goal and listener, persistent signaling until a goal is achieved and waiting for a response. However, Kossyvaki (2017) rejects these as useful measures because children with autism are likely to have eye gaze processing difficulties (Pelphrey et al., 2005), as well as significant theory of mind and difficulties (Baron-Cohen, 1995), often showing no awareness of communicative failures (Meadan et al., 2008). Therefore, in this project, communicative intent is defined by the presence of a 'receiver,' or adult.

The medium of transmission refers to the method by which a message is transmitted. Wide variation in methods used is present in autistic individuals, ranging from symbolic methods such as speech and signing, to gesture or action. Up to 50% of autistic individuals may never develop functional verbal communication (National Research Council, 2001) and some individuals with autism make their needs known only through non-specific vocalisations, eye contact or the instrumental use of others' bodies (Clifford et al., 2010). Young children may not see the need to communicate in a verbal manner (Wall, 2004). Sinclair (1992, p.296), an autistic man, wrote "learning how to talk follows why to talk and until I learned that words have meanings, there was no reason to go to the trouble of learning to pronounce them as sounds".

Something to communicate about is the function or purpose of communication. Communicative acts serve a range of functions that are grouped in the literature under three sections: behaviour regulation

(e.g. requesting and protesting), social interaction (e.g. attracting and maintaining attention to oneself or requesting social routines), and directing another's attention to an object or event (e.g. commenting or requesting information). Wetherby (1986) proposed these three sections, noting that typically children develop synchronously across all three strands, whereas students with autism tend to first develop skills in communicating for behaviour regulation purposes, then for dyadic shared attention with a partner, and finally for triadic shared attention with a partner and other object or event. Empirical research using cross sectional and longitudinal designs support this model (Stone & Caro-Martinez, 1990; Wetherby et al., 1989), with behaviour regulation (requesting and rejecting) reported by many studies as the most commonly used function for autistic children (Agis, 2009; Potter & Whittaker, 2001; Chiang, 2009; Chiang & Lin, 2008; Kossyvaki, 2017), although Birkeneder and Sparapani (2022) found commenting to be most frequently observed.

Autistic writers have emphasised that all autistic people have an inner language, even if they cannot communicate through conventional methods (Bogdashina, 2022). Furthermore, each individual develops a unique system, usually incorporating a range of methods for different functions and messages. As explained by Williams (2009), an autistic woman:

> I had a whole system of relating which I considered my language. It was other people who did not understand the symbolism I used, and there was no way I could or was going to tell them what I meant. I developed a language of my own. Everything I did, from holding two fingers together to scrunching up my toes had a meaning. (p.30)

2.2.4 Understanding and measuring spontaneity in communication

Spontaneity is a critical component of functional expressive communication (Rämä et al., 2014). Spontaneous communication gives people greater control over their environment, it is fundamental for learning about the world and fostering key relationships (Chiang & Carter, 2008). It allows autistic individuals to make their needs known, avoiding dependency on partners to anticipate and predict their needs (Carter & Grunsell, 2001). Potter and Whittaker (2001) make the point that spontaneous communication is key for self-determination, with all the implications this has for independence and wellbeing. Therefore, spontaneous communication has been identified as the most important goal in educating autistic students (National Research Council, 2001; Prizant & Wetherby, 2005).

It is widely reported that autistic students lack communicative spontaneity, particularly those with learning difficulties, (Andzik et al, 2016; Birkeneder, & Sparapani, 2022; Chung et al., 2012). Birkeneder and Sparapani (2022) used video analysis across 112 children and found a low rate of spontaneous communication (0.69 initiations per minute), which is in line with earlier studies (Stone & Caro-Martinez, 1990). However, children display heterogenous profiles of communicative spontaneity, and the true nature of spontaneous communication in children with autism is not well understood (Chiang, 2009). For example, Chiang (2008a) found that children with autism and limited speech produced more spontaneous communication than elicited communication, also arguing that some autistic individuals may be *too* spontaneous in a given context to functionally meet their needs (Chiang & Carter, 2008). Birkeneder and Sparapani (2022) also found that within their sample of 112 children, 5 children, in fact, initiated quite often (3.0 – 5.67 initiations per minute), whereas 19 children did not initiate at all.

Variance in research findings may in part be due to a lack of consistency regarding what is being measured. Communicative spontaneity is not clearly defined in the literature (Duffy & Healy, 2011), making it challenging to compare findings. Definitions can include features such as the sequence of interaction, topic introduction, or time passed since the provision of a prompt (Rämä et al., 2014), as well as definitions based on linguistics for children who use speech (Chiang & Carter, 2008). Furthermore, it is challenging to find a middle ground that represents the complexity of the concept whilst implementing clear operational boundaries that allow for measurement. Most definitions found in the literature focus on the degree to which a communicative act is prompted, either adopting a binary or continuum understanding of this.

Studies that require a clear operational boundary tend to adopt a binary understanding - a communicative act either is, or is not, spontaneous. For example, Potter and Whittaker (2001) define spontaneous communication as any communication that is not verbally prompted; Chiang (2008a) defines spontaneous communication as communication that is not prompted by a partner; Birkeneder and Sparapani (2022) define it as acts of unprompted and intentional communication directed towards another person to serve a function. Some studies define what they mean by a 'prompt', others do not. Importantly, the definition adopted is usually chosen to establish a helpful threshold for the students in a particular study. Although this can make comparison between studies challenging, it allows measurement to be meaningful for the cohort of students taking part.

Some authors argue for a continuum understanding of spontaneity. Carter and Hotchkis (2002) state that spontaneity should not be considered an all-or-nothing phenomenon but a continuous variable, with the distinction between 'initiation' and 'response' being redundant. Carter and Hotchkis (2002) suggest characterising spontaneity based on the obviousness of controlling antecedents, offering a Four Level Antecedent Model ranging from natural cues (most spontaneous), to stimulus highlighting, to generalized communicative cues, to direct prompts (least spontaneous), as shown in Table 1. Rämä et al. (2014) drew on this model with teachers in a Finnish context, as it makes the features of their practice that affect spontaneous communication visible.

This study adopts a continuum conceptualisation as it offers greater explanatory power and facilitates staff understanding of communicative spontaneity (Carter & Hotchkiss, 2002). An adult's interactive style is, in effect, offering environmental and interpersonal prompts for spontaneous communication. A continuum understanding is also a helpful way to explain the importance of adult mediation at a level that offers the most effective degree of scaffolding, allowing students to extend their skills. However, as the aim of this study is to measure change in quantity, function and method of spontaneous communication, rather than change in degree of spontaneity, a cutoff point needed to be established. Kossyvaki (2017) adopted a continuum understanding of spontaneity to underpin her Adult Interactive Style Intervention, and a binary understanding to measure change in the students. In order to maintain conceptual integrity, this study will use Carter and Hotchkiss' (2002) Four Level Antecedent Model, a continuum conceptualisation, but agree an appropriate cut off point along this continuum, with staff, for measurement purposes.

Table 1: The four-level antecedent hierarchy

Level	Definition	Example of variable	Description	Example
1.Direct prompting	Prompts with the primary intent to directly elicit a specific communicative act by the learner and specify the content and/or form of the act	1.Physical prompt	Physical contact directed at occasioning a specific communicative act.	Teacher physically assists student to form a sign or point to a specific symbol.
		2.Instruction	Learner is instructed to perform specific communicative act.	Teacher says 'Sign biscuit'.
2.Generalised communicative cue	Deliberate general signals that indicate that a communicative act is required or anticipated but do not designate a specific communicative act.	1.Question or mand	Learner is asked question or manded to produce a communicative act.	Teacher says 'What do you want?' or 'Tell me what you want' during morning tea.
		2.System presentation	Aided communication system is presented to learner to indicate that a communicative act is anticipated.	At morning tea teacher holds food object symbol board up for learner to request refreshment.
		3.Expectancy	A sustained expectant look and posture (neck/body arched forward, shrugged shoulders, eye contact, lips pursed, eyebrows raised)	Teacher looks expectantly at learner during morning tea routine waiting for request for refreshments.
3.Stimulus highlighting	Techniques used by partners that either systematically manipulate the number of occasioning variables available to the learner or their saliency, in order to focus learner's attention on some aspect of the natural stimulus complex	1.Comments	Comments that are intended to direct attention to some aspect of the natural stimulus complex.	During morning tea teacher comments 'That toast smells nice!' in attempt to elicit request for toast.
		2.Alter saliency of object or activity	Saliency of object or activity is increased to draw learner's attention to it.	Drink is moved, placed closer or placed in direct view of learner in order to draw attention to it. Teacher taps cup to draw attention to it.
		3.Exaggeration	Teacher exaggerates action to highlight saliency	Teacher pours juice with exaggerated action in front of learner.
4.Natural cues	Cues that are likely to occasion communication and have a high probability of being present in environment of an age-matched non-disabled peer.	1.Presence of referent	Referent is present during communicative interaction	Drink is on table in view of learner.
		2.Natural context	Contexts are considered natural if they occur at an appropriate time of the day, appropriate setting and with appropriate partners	Learner etas morning tea with peers at table at appropriate time of day.
		3.Presence of partner	A partner is present or can be summoned.	

Note: From "A conceptual analysis of communicative spontaneity" by M. Carter & G. D. Hotchkis, 2002, *Journal of Intellectual and Developmental Disability*, 27(3), p.117 (https://doi.org/10.1080/1366825021000008602) Copyright 2002 by Taylor & Francis. Reprinted with permission.

2.3 Enabling Spontaneous Communication

Chiang and Carter (2008) attribute the difficulties autistic students experience with spontaneous communication to within child theories as well as motivational factors and inadequate facilitation of spontaneity. As highlighted by Gray (2000, cited in Kossyvaki, 2017), adults hold more than half the solution. There is an increasingly explicit focus in the literature on transactional support within the classroom (Potter & Whittaker, 2001; Prizant et al., 2006), one aspect of which is an adult's interactive style.

To understand the development of this Adult Interactive Style Intervention, established behaviourist and developmental interventions are summarized and literature pertaining to adult interactive style is explored, specifically the work of Kossyvaki (2017). Kossyvaki's (2017) Adult Interactive Style Intervention (AISI) consists of 13 general principles and 8 communicative opportunities. In this Adult Interactive Style Intervention, staff chose to focus on communicative opportunities, therefore these are of particular focus in this review. Approaches to training staff are discussed and the paucity of research with secondary aged students is highlighted.

2.3.1 Developmental and Behaviourist Interventions

Naturalistic interventions within autism research can be classified into developmental and behaviourist categories, based on their underpinning psychological paradigms (Ingersoll et al., 2012). Developmental approaches (e.g. Intensive Interaction) focus on the fundamentals of communication, defined as those skills and understandings that usually precede the development of language (Nind & Hewett, 2001). The adult follows the child's lead, adjusts to their communicative level, and interprets all communicative attempts as intentional - drawing on similar communicative repertoires an adult would naturally use with an infant (Hewett, 2012). These approaches are founded in developmental psychological theories that highlight the importance of attuned interactions, including attachment theory and brain development (Hewett, 2012). Developmental approaches are also aligned with humanistic and positive psychology (Firth et al., 2021). Behaviourist approaches use direct prompting and reinforcement within natural contexts to teach specific communication skills (Lee, 2023). The environment is set up to promote initiations and time delay procedures are implemented. These approaches are founded in the behaviourist paradigm whereby antecedents are used as motivators and opportunities for teaching.

Discrete Trial Teaching (Richman, 2001) is firmly in the behaviourist category, alongside Picture Exchange Communication System (PECS, Bondy & Frost, 2011); whereas Intensive Interaction (Nind & Hewett, 2001) is firmly in the developmental category, alongside SCERTS (Prizant et al., 2006). Developers of certain prominent manualized interventions, such as Enhanced Milieu Teaching (Hemmeter & Kaiser, 1994), and Pivotal Response Training (Koegel et al., 1999) have re-branded these interventions under a new category termed Naturalistic Developmental Behavioural Interventions (NDBIs, Schriebman et al., 2015).

There is no scope within this project to review the literature pertaining to individual interventions. However, a general critique of behaviourist approaches is that they can be too prescriptive, potentially reducing spontaneity and leading to prompt dependency (Chiang & Carter, 2008). Most NDBI procedures are manualised, with strategies to be implemented in a prescribed order, which can present challenges in busy home and school contexts (Lee et al., 2023). However, Rämä et al. (2014), who adopt a continuum understanding of spontaneity, consider this a simplification and argue that many variables need to be considered. A general critique of developmental interventions is a poor evidence base, comprising of case studies rather than experimental designs (Ingersoll, 2010).

There is little clarity over which approach is best suited to particular children. Brunner and Seung (2009) cite studies (Sherer & Schreibman, 2005; Stoelb et al., 2004) suggesting that behavioural interventions produce better outcomes for more cognitively able children, whereas other studies have reported the reverse (Yoder et al., 1995). Again, the heterogeneity of this group of students in terms of their personalities, abilities and needs should be emphasised.

Importantly, most interventions draw on both underpinning psychological paradigms and may not vary drastically in their real-world implementation (Ingersoll & Dvortcsak, 2006). Therefore, a combined approach seems appropriate in a school setting. Some have raised concerns that eclectic approaches are ineffective (Dillenburger, 2011). However, Kasari and Smith (2013) argue that informed, rather than random, eclecticism can offer an individualised, modular approach whose sum is greater than its parts, promoting superior individual outcomes.

2.3.2 Adult interactive style

The concept of an *adult interactive style* in the literatures usually describes an eclectic approach, distilling advice and strategies from both behavioural and developmental interventions to inform how adults can adopt a communication enabling manner. Adult interactive style has largely been explored in the home context (e.g. Drew et al., 2007; Doussard- Roosevelt et al., 2003; Ruble et al., 2008; Killmeyer et al, 2019). Significantly fewer studies investigate adult interactive style in the school context. School based research has focused on eliciting staff and student views (Potter & Whittaker, 2001; Natt, 2015) regarding what constitutes a communication enabling adult style, as well as implementing a set of strategies and measuring impact (Hwang & Hughes, 2000; Ingersoll et al., 2005; McAteer & Wilkinson, 2009; Kossyvaki, 2017).

Potter and Whittaker (2001) explored what constitutes a communication enabling style across autism specialist classes in five special schools, involving 18 young children. They used video observation and interviewed staff to gather their views. Their findings showed that frequent opportunities for communication, non- verbal methods of interaction, a minimal speech approach and long pauses enabled spontaneous communication. Natt (2015) interviewed 6 primary aged children with autism who attended a resource provision attached to a primary school, about what they felt enabled communication. Questioning, photographs, drawing and small world play were used to gather student views. Natt (2015) reported that students expressed a preference to be spoken to 'in a nice way' using visual aids; the students also raised the importance of adults providing concrete rewards and meeting daily needs, such as providing food.

Hwang and Hughes (2000) provided social interactive training to staff, including contingent imitation, naturally occurring reinforcement, expectant looks, and environmental arrangements. They found the social communication skills of three nonverbal preschool children with autism improved, specifically increased eye contact, joint attention and motor imitation. Ingersoll et al. (2005) used a single-subject multiple baseline design to examine the effectiveness of an interactive style which included following the child's lead, engineering opportunities for initiation, acknowledging all communicative attempts, emphasizing affect and using indirect language stimulation. They found an increase in spontaneous speech, and some indication of generalisation. McAteer and Wilkinson (2009) worked with staff in an all-age special school to implement a non- directive facilitative style and found qualitative evidence of a change in adult behaviour, as well as increased spontaneous communication in students.

2.3.3 Adult Interactive Style Intervention

This Adult Interactive Style Intervention is an extension of work undertaken by Kossyvaki (2017). She developed an Adult Interactive Style Intervention to enable the spontaneous communication of young children with autism for her doctoral thesis in 2012, later publishing several papers (Kossyvaki et al., 2012; Kossyvaki, 2013; Kossyvaki et al., 2016) and a book about her study (Kossyvaki, 2017).

Kossyvaki (2017) conducted an extensive review of the intervention literature, across developmental and behavioural approaches, to synthesize a set of 13 general principles and 8 communicative opportunities relating to how adults should interact with autistic children, which she named AISI (Appendix A). The AISI general principles are mainly based on developmental approaches whereas the AISI communicative opportunities are more aligned with behaviourist approaches.

Participants included six children aged between four and five years, and three members of staff. Kossyvaki (2017) edited pre-intervention videos to highlight good practice with reference to suggestions in the literature. The videos were shown to staff participants during training sessions and staff were supported to reflect on them. Action research principles were used to implement strategies in collaboration with staff.

Results showed that staff considerably increased the number of times they used AISI principles post-intervention and there was a statistically significant increase in total initiations for all six children. Although an Adult interactive Style Intervention (Kossyvaki, 2017) has not been investigated further in other published studies, the strategies have a strong conceptual basis and are considered by Imray and Hinchcliffe (2014) as such “fundamental principles that they definitely bear repeating” (p148). Imray and Hinchcliffe (2014) repeat the 13 general principles and 8 communicative opportunities in their curricular guidance for teaching students with SLD.

2.3.4 Communicative opportunities

The staff in *this* Adult Interactive Style Intervention chose to focus solely on incorporating communicative opportunities into their style of interaction, as they felt that the general communicative

principles outlined by Kossyvaki (2017) were already a core part of their practice based on Intensive Interaction. Six of the eight communicative opportunities from the original AISI principles were implemented in this intervention.

Bogdashina (2022) points out that too often adults *read* the intentions/ wishes of children, without giving the child an opportunity to transmit the message, arguing that it is crucial to create as many opportunities for a child to see the power of communication as possible, using different communicative functions in specially created situations. The importance of adults providing students with communicative opportunities is highlighted across behavioural and developmental interventions but underpinned by behaviourist principles, in that the opportunity is intended to act as an antecedent, and motivator, for spontaneous communication.

Milieu Teaching (Gilbert, 2006) is based on arranging the environment in a way that promotes spontaneous requesting by the child. Wetherby and Prizant (1989), who later created the SCERTS framework, refer to opportunities as 'communicative temptations' and highlight their importance for developing active rather than passive communication. Bondy and Frost (2011) highlight spontaneous initiation as the first goal of PECS (Bondy & Frost, 2011), suggesting a range of 'communication enhancement strategies' as powerful motivators. Potter and Whittaker (2002) found that children who often request are well motivated by their environment and therefore initiate communication regularly. There is a consensus across interventions and approaches that an important part of a communication enabling adult interactive style, is providing planned communicative opportunities.

The impact of training staff to implement communicative opportunities has been recently studied in the US (Andzik & Cannella-Malone, 2019; Wermer et al., 2017). Wermer et al. (2017) trained a teaching assistant or paraeducator to implement both opportunities to initiate and respond, using a hierarchy of least to most prompting, similar in principle to Carter and Hotchkis' (2002) continuum understanding of spontaneous communication. They found that providing opportunities to initiate was rapidly acquired by paraeducators and there was an immediate positive impact on the target student. Although this is a single case study, with the target student being a young child with autism and learning difficulties, the findings are positive. Of greater relevance is a similar study conducted by Andzik and Cannella-Malone (2019) using a multiple baseline design across four student participants, including three secondary aged students with autism and complex communication needs. Andzik and Cannella-Malone (2019) taught

three teachers to train four paraeducators to provide opportunities to initiate, incorporating least to most prompting strategies. Procedurally, this included setting up the opportunity, gaining the student's attention, staying close, waiting five to ten seconds, and then providing least to most prompting as needed. Staff implementation of communicative opportunities increased from 0 opportunities per minute of observation to an average of 0.6 per minute; the students' spontaneous communication as a group increased from 0 initiations per minute to 0.61 per minute of observation.

Although communicative opportunities form a part of various approaches and interventions, there is little research focusing specifically on their use, beyond the two studies outlined above. Although limited, the findings are encouraging. Wermer et al. (2017) conclude that if all special education staff were trained to provide and capitalise on communication opportunities across the school day, they could have a profoundly positive impact on the lives of students with complex communication needs.

2.3.5 Training approaches

Interventions focused on developing elements of adult interactive style differ in terms of the approach they take to training staff. The time spent training staff varies considerably. Hwang and Hughes (2000) trained staff for two hours a day, five days a week for two weeks. Other studies place greater focus on the research to practice link, taking into consideration time requirements to ensure real world transferability (Andzik & Cannella-Malone, 2019; Kossyvaki, 2017; McAteer & Wilkinson, 2009; Werner et al., 2017). The underpinning theory influencing training delivery and format also varies. Kossyvaki (2017) and McAteer and Wilkinson (2009) place greater emphasis on critical reflection as a tool for behavioural change, whereas Andzik and Cannella-Malone (2019) and Werner et al. (2017) describe a more directive approach, identified as behavioural skills training (BST). This includes a core combination of modelling, rehearsal, and verbal performance feedback, as well as written instructions for implementation as needed. Their approach was predicated on a meta-analysis and literature review that found statistically significant associations between implementation fidelity and BST across practitioner training studies in special education (Brock et al., 2017). According to the studies available, both approaches seem to produce positive outcomes.

2.3.6 Secondary aged students

No further studies specifically focusing on adult interactive style, or the use of communicative opportunities, with secondary aged autistic students with SLD were found in this review. The key studies reviewed have been conducted with younger children (Potter & Whittaker, 2001; Kossyvaki, 2017), as has much of the broader communication intervention research focused on students with autism and learning difficulties (Parsons et al., 2011; Pelicano at al., 2014).

A recent review of the literature on training education professionals to use PECS with their students (McCoy & McNaughton, 2019), including increasing the quality and quantity of the communicative opportunities staff offered, showed positive outcomes, but in five of the seven studies, the children were aged between 2-8 years, and the other two studies were conducted with adult learners (Barnes et al., 2011; Rosales et al., 2009). A systematic review of the effectiveness of Intensive Interaction (Hutchinson & Bodicoat, 2015) does not identify any studies explicitly stating they were conducted with secondary aged students; most studies reviewed focused on adults. Koegel et al.'s (2020) systematic review of all intervention studies supporting nonverbal or minimally verbal autistic individuals returned 31 research articles; eight studies were exclusively conducted with pre- school children, 11 studies were exclusively conducted with primary children, 10 studies were conducted with a combination of pre-school and primary children, leaving two studies that included participants aged 5- 23 years (Miller & Miller 1973; Tardiff et al. 2017). The only recently conducted study identified in this review (Tardiff et al., 2017) used a multiple case study design and only one of the case students was a secondary aged young person, limiting the power of this research to inform real-world change.

Perhaps the dominance of research with younger children is not surprising, given the importance of early intervention (National Institute of Child Health and Human Development, 2017; Zwaigenbaum et al., 2015). However, a number of meta-analyses have found that chronological age at intervention does not significantly impact outcomes (Crank et al., 2021). It is encouraging to see research conducted with adults, but secondary aged students seem greatly overlooked.

2.4 Rationale for the study

A review of the literature suggests that this study could make a useful contribution to students, special school staff, and the profession of educational psychology.

2.4.1 For students

Spontaneous communication has been identified as the most important goal in educating autistic students (National Research Council, 2001; Prizant & Wetherby, 2005). Kossyvaki's (2017) Adult Interactive Style Intervention led to a statistically significant increase in the quantity of spontaneous communication in young children. Kossyvaki et al. (2016) suggest that further research is needed with different populations and in different contexts, including older children attending broad spectrum special schools. Secondary aged students with learning difficulties are a notably under-researched group within the autism literature (Pelicano at al., 2014) and conducting research in a school setting can reach students who are "historically underserved, underrepresented and under-resourced" (Kasari & Smith, 2013, p.1). Therefore, this intervention study has the potential to benefit the students taking part as well as contributing to the knowledge base around what works for older students with autism and SLD.

2.4.2 For school staff

The socio- political context in the UK has arguably led to a void in national guidance and training for staff supporting students with SLD and PMLD (Rees, 2017). Enabling communication has been highlighted as a key area for professional development by teachers and teaching assistants in the UK (Martin & Alborz, 2014). This is reflected in the US literature too, which also highlights challenges around the implementation of evidence-based practices (Andzik et al., 2019; Brock, 2020; Coogle et al., 2022). Although schools can access manualised interventions, these can be challenging to apply effectively as they are rigid, prescriptive and one size does not fit all (Lee et al., 2023). An Adult Interactive Style Intervention seeks to facilitate staff understanding of spontaneous communication and work with staff to deliver intervention that is feasible, appropriate, and effective for the students they teach.

2.4.3 For educational psychologists

Government publications mention a specific role for EPs in upskilling staff who work in special schools with students who have disabilities (Atfield et al., 2023; Lyonette et al., 2019). However, EPs report a lack of confidence, knowledge, and ideas regarding their role in supporting students attending special schools (Winter & Bunn, 2019). The educational psychology literature reveals a possible incongruence between the expertise EPs offer and the expertise school staff hope for, namely process versus content-

based knowledge (West & Idol, 1987, cited in Miller, 1996). This intervention study draws on both knowledge bases as well as interests within the profession, including - promoting inclusion through co-designed interventions and services (Rouf, 2015), facilitating staff working groups (Hanko, 2016), applying evidence-based knowledge and research to solve problems (Gersch, 2004), using strengths-based approaches (Seligman, 2009) and taking real steps towards facilitating child voice (Harding et al. 2009). Therefore, this intervention study has the potential to broaden the offer of educational psychology services.

2.5 Research aim and questions

The aim of this research project is to find out how the spontaneous communication of three young people with autism and SLD is impacted by an Adult Interactive Style Intervention in order to inform future EP practice. The research aim is addressed through the following three questions:

1. Does the spontaneous communication of each student improve post- intervention?
2. What are staff views regarding implementation of the agreed strategies?
3. Which factors impacted the success of the intervention?

CHAPTER 3: METHODOLOGY

This chapter describes the logical sequence (Yin, 2009) that runs through the methodology of this study, moving from the study's philosophical position to research design, intervention procedure, research methods and data analysis.

3.1 Philosophical Position

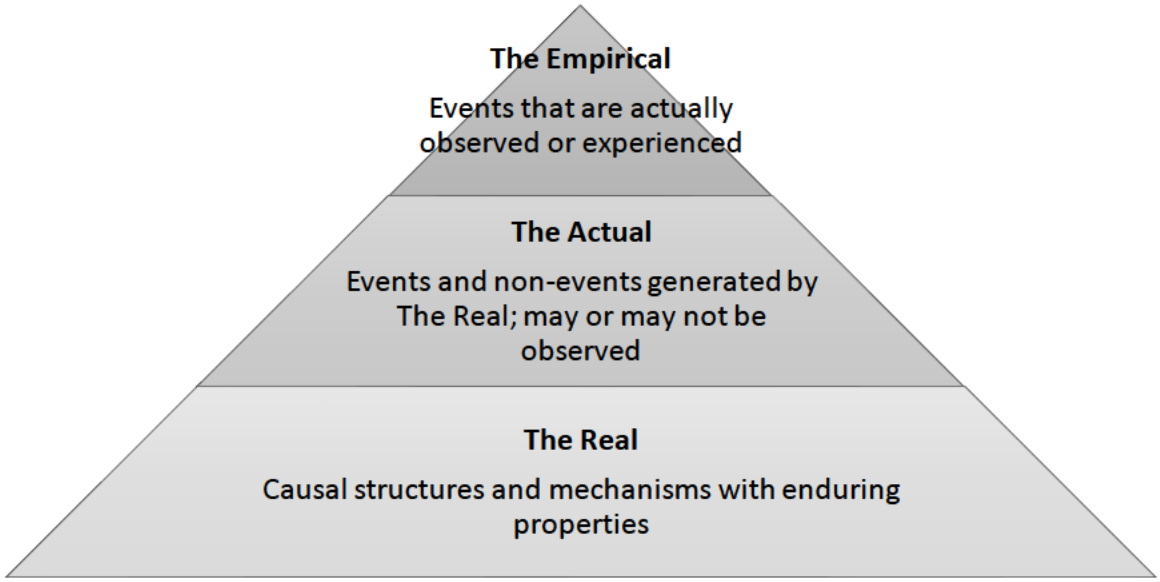
The philosophical assumptions created by the research question and the researcher's world view regarding theory of knowledge should be transparently stated (Willig, 2013).

3.1.1 Ontology and epistemology

This research is underpinned by a critical realist approach founded on ontological realism and epistemological relativism (Archer et al., 2016). Ontology refers to the researcher's assumptions about the nature of reality, or the nature of the phenomenon being investigated. Epistemology refers to the researcher's assumptions about whether and how we can access that reality. The critical realist philosophical position to research in the social sciences can be understood as a middle ground, or least restrictive position (Bhaskar & Danermark, 2006) within the interpretivist - positivist continuum. Unlike the interpretivist ontological position, where social reality is constructed by human consciousness and does not exist separate to this, critical realists hold that there is a social reality which exists independent of its human conception (Archer, 2013). Unlike the naïve positivist epistemological position, where empirical data is considered to provide direct access to reality, critical realists hold that access to reality is subjectively mediated, culturally situated and imperfect (Smith, 2006).

Social scientists adopting a critical realist position are guided by Bhaskar's (2008) stratified ontology, depicting the depth of social reality as well its challenges in terms of accessibility (Figure 1). It distinguishes between three levels of reality - the empirical, the actual and the real. The real is the deepest ontological level and includes structures and mechanisms with enduring properties; the actual level includes events that are generated by the structures and mechanisms; and the empirical level includes phenomena that can be observed and experienced.

Figure 1: Model depicting critical realist stratified ontology (Saunders et al., 2015)



Research data provided by participants and interpreted by the researcher is accessed at the empirical level, which is observable yet theory laden and subjective. Furthermore, empirical data only provides the researcher with partial insight when trying to understand complex human phenomena (Sayer, 2000). Although researchers do not have access to the deepest domain in Bhaskar's (2008) stratified reality, the objective when pursuing critical realist research is to use perceptions of empirical events to tentatively postulate on underlying mechanisms within the domain of the real (Sayer, 1992). These tentative causal connections are not isolated but viewed as part of an open system where other mechanisms and conditions also exist (Zachariadis et al., 2013). The issue of causation is multi-faceted and complex, yet a key aspect of a critical realist approach is to ask questions around what enables, leads to, and generates observable phenomena (Wiltshire & Ronkainen, 2021).

3.1.2 Rationale for critical realism

This study seeks to implement a change in the interactive style of adults so as to improve the spontaneous communication of the students they work with. It is aligned with a critical realist philosophical position for three key reasons. Firstly, Bhaskar's (2008) reintroduction of realism creates a conceptual platform for emancipatory action, or the development of educational practice, by not reducing empirical data to interpretation through the conflation of ontology and epistemology.

Secondly, the outcomes of this action research case study are deeply contextually bound and should be viewed in light of the unique and changing contexts in which people work together to facilitate change (Kelly et al., 2008). Critical realists highlight the complexity of the social world and recognise that outcomes have little value in isolation (Pawson & Tilley, 1997). Thirdly, the tentative exploration of underlying mechanisms or factors that facilitate or pose barriers to change is considered a key part of the puzzle to answering the overall research aim. To find out *how* the spontaneous communication of three young people with autism and SLD is impacted by an Adult Interactive Style Intervention, I need to consider *what* happens but also make tentative hypotheses about *why* this may be the case. The study seeks to understand the impact of an Adult Interactive Style Intervention, investigating the functioning of the intervention within a real-world context to inform future applied educational psychology practice. The search for ontological depth matters because "just as theory without action is meaningless… action without understanding is blind" (Reason & Bradbury, 2008, p.2).

3.2 Design Frame

This project used an action research design frame to produce a nested case study, with a mixed methods approach to data collection.

3.2.1 Case study

This project produced a nested case study (Thomas, 2021). A nested case study has individual units that are nested within one wider case. This project focused on three students within the wider case of the intervention group in order to understand how this Adult Interactive Style Intervention impacted the spontaneous communication of the students. Case study research is compatible with action research in facilitating in-depth investigation suitable for answering 'how' questions or research aims (Thomas, 2021; Yin, 2009).

3.2.2 Action research

Action research has numerous definitions that give partial weighting to different facets of this flexible design depending on the theoretical beliefs prioritised. Thomas (2017) outlines the basic ideas at the core of action research as bridging the gap between research and practice, engaging in a cyclical process

of action and critical reflection, and empowering practitioners through collaboration. Cohen et al. (2018) make a distinction between authors who prioritise the practical outcome of action research to bring about change and authors who prioritise the collaborative and emancipatory orientation of action research. However, these aims are not mutually exclusive and both are of importance in this study. The project hoped to facilitate change, combining action and reflection to improve practice through collaboration.

3.2.2.1 Role of the researcher

Collaboration between school staff and researcher as equal partners has been shown to improve teaching by bridging the gap between research and practice (Leeman et al., 2018). This collaboration is considered of particular importance when working with children and young people on the autistic spectrum (Imray & Hincliffe, 2014; Parsons et al., 2013), and 'Recommendation 8' of the Rochford Review (DfE, 2016) specifically encourages schools to engage in research. An academic action researcher can take on varied roles, including providing minimal direction (Day & Townsend, 2007) or acting as a critical friend (McNiff & Whitehead, 2006), within this collaborative partnership (Platteel, 2010). This study is based on democratic partnership (Hall, 2001) between researcher and school staff, where the researcher contributes their knowledge and skills, taking part as consultants in practice. The aim was not knowledge transfer from researcher to school staff but knowledge exchange as equal contributors (Parsons et al., 2013). Top down or 'evidence - based practice' gathered from the literature (Kossyvaki, 2017) and bottom up or 'practice - based evidence' gathered from school staff formed the foundation of agreed actions.

3.2.3 Mixed methods

Quantitative and qualitative data were collected to produce a mixed methods study. A convergent parallel design was used whereby quantitative and qualitative data were gathered in the same phase of the research, as opposed to one data set informing the other, as in a sequential design (Creswell & Clark, 2017). A convergent parallel design allows for the integration and comparison of data, adding richness and depth, and enabling one data set to validate or contradict another. Quantitative data is illustrative, descriptive and identifies trends; whereas qualitative data provides participant perspective and

explanation, potentially uncovering mechanisms that produce outcomes (Zachariadis et al., 2013). This draws on the inherent value that critical realists hold for 'methodological pluralism' (Danermark, 2002).

3.2.4 Critique

Critics of action research case study design argue that findings are insufficient to support substantial change (Hallet & Hallet, 2015). Small scale real-world research is said to lack generalisabilty and rigour, due to the potential for observer bias and difficulty 'cross- checking' findings (Cohen et al., 2018).

In answer to the issue of generalisablity, the aim of this study was to facilitate change in a real world setting where complex conditions exist. Action research case study acknowledges that change happens within open and nonlinear social systems, in line with complexity theory (Phelps & Hase, 2002) and critical realism (Bhaskar, 2008). Interventions are critically influenced by their implementation in a given context (Pfadenhauer, 2022). Therefore, this project is not concerned with aiming to achieve detached and generalisable knowledge (Bergmark, 2022). However, that does not preclude it from contributing towards the expansion of collective learning as an "authenticated anecdote" (Simons, 2009, p.4), offering analytical rather than statistical generalisation (Flyvbjerg, 2006; Yin, 2009).

In answer to the issue of rigour, there is no intent within action research case studies to achieve rigour in the positivist sense. Although many researchers focusing on communication and autism have chosen to conduct studies in laboratory settings, the practical application of their conclusions has been limited (Roos et al., 2008). Research undertaken in real-world settings ensures ecological validity and bridges the gap between research and practice (Chiang, 2009; Kasari & Smith, 2013).

3.3 Quality Assurance

The quality of a study, or the level of confidence that can be demonstrated in its findings, is determined in relation to its philosophical underpinnings. Quality assurance, understood through a fallible critical realist epistemology, is enhanced in this study by reducing observer bias through triangulation, clearly stating the positionality of the researcher and the impact this may have on data analysis, and establishing trustworthiness through transparency and auditability.

3.3.1 Triangulation

Triangulation enhances rigour through corroboration (Thomas, 2017). Denzin (2017) identifies several ways in which triangulation can be achieved. This study used methodological triangulation by combining qualitative and quantitative approaches to data collection. Methodological triangulation allows one data set to be validated by another, and to be checked from multiple standpoints (Creswell, 2015), strengthening the findings. In addition to methodological triangulation, investigator triangulation was also used to corroborate quantitative video analysis of the students' spontaneous communication through inter-rater reliability checks.

3.3.2 Reflexivity

Critical realists adopt a fallible epistemology in which it is understood that empirical data can only be interpreted through the subjective perspective of the researcher. This is of particular relevance for qualitative data gathering and analysis. Therefore, researcher reflexivity regarding personal biases, values, and interests should be made clear to enhance rigour (Denscombe, 2017). My positionality is outlined in the introduction, with personal, professional and theoretical influences clearly stated. These influences provide a schema through which I am disposed to make methodological decisions and interpret data.

3.3.3 Trustworthiness

Trustworthiness refers to the degree of confidence a reader can have in the data, interpretation and methods used (Polit & Beck, 2014) which can be achieved through transparency and auditability (El Hussain et al., 2015). Therefore, a detailed record of all methodological decisions, including analytical procedures and their implementation are outlined in the remainder of this chapter. For example, trustworthiness was established in quantitative data obtained from video analysis of the students' spontaneous communication pre and post intervention by using a transparent and detailed process for data collection and coding (3.7.1). Trustworthiness in qualitative data was established by adhering to a systematic and transparent approach to thematic analysis, informed by a critical realist philosophical position (3.8.2).

3.4 Ethical Considerations

Ethical approval was granted by the University of Birmingham's Ethical Review Committee in April 2022. Ethical decisions were taken in light of the Code of Human Research and Ethics (British Psychological Society, 2021) and the Ethical Guidelines for Educational Research (British Educational Research Association, 2018). Ethical considerations and their management are summarised in Table 2.

Table 2: Management of ethical considerations

Aspect	Management
Informed consent	Informed consent from the students' parents (Appendix B) and participating staff (Appendix C) was obtained. The written consent form was accompanied by an information sheet explicitly outlining the project and participant involvement. Further clarification in person to both parents and staff was offered but not sought. Students were unable to provide informed consent, but additional precautions were taken to ensure their wellbeing, as detailed in the section addressing harm arising from participation.
Right to withdraw	Participants' right to withdraw was explicitly stated in the staff and parent information sheets and consent forms. Information sheets stated that parents and staff had one month after the project's completion to withdraw their data or their child's data by contacting the researcher, and that this would not entail any negative consequences.
Privacy and data storage	All data was pseudo- anonymised. Each participant was assigned a pseudonym that was only identifiable by the researcher in written data (including transcripts and observation coding data). Video data could not be anonymised. All data was securely stored on an encrypted memory stick, accessible only by the researcher and kept in accordance with University of Birmingham policy. All participants are anonymised in this report and care has been taken to ensure that any details included cannot be traced back to individual staff or students.
Harm or risk arising from participation	Research design aimed to recognise potential risks and be able to manage any discomfort that may arise for both staff and students, as detailed below. This was of particular importance for students who were all under 16 and unable to give informed consent. • As students might find a new person in the classroom unsettling, I visited regularly prior to starting the project to get to know the students. • I liaised closely with adults who knew the students well to ensure that my presence did not cause upset and I left promptly if there was any indication that this may be the case. • As the students were unable to give informed consent to being filmed, it was paramount to implement an ethical filming procedure. The students' consent

Aspect	Management
	could be inferred, to a degree, through their behaviour. Therefore, the Leuven Scale (Laevers, 2005), an observation tool, was used to ensure that students were comfortable during filming. The Leuven Scale (Appendix D) is a five-point scale for wellbeing and engagement, with descriptors ranging from extremely low (level 1) to extremely high (level 5). Students were only filmed when their behaviour suggested moderate to extremely high (level 3 - level 5) wellbeing and engagement. Filming stopped whenever observation suggested student wellbeing and engagement dipped below this threshold. • If a strategy agreed collaboratively proved unsuitable or upsetting for a student during the strategy implementation stage, staff were made aware that its implementation should be adapted or it should not be used. • It was possible that staff would find the process of being videoed uncomfortable. They were reassured that no video data on staff implementation of strategies was collected during the project in order to dispel any concerns related to 'performance management.' Any data collected on the implementation of strategies was disclosed by staff themselves. • Staff were reassured that any additional workload would be negligible as the intervention is naturalistic and does not entail additional demands or changes to the school day.
Feedback to participants	Staff participants were offered a feedback session and the families of student participants were offered a short strengths-based report detailing progress made.

3.5 Participant Recruitment

Opportunity sampling (Denscombe, 2017) was an appropriate approach to recruitment. This involved working with a setting that was known to me and had expressed an interest in the research topic.

3.5.1 The school

This Adult Interactive Style Intervention took place in a community maintained secondary special school, rated outstanding by Ofsted in 2017. The school has around 200 students and is a broad-spectrum school, supporting a wide range of need. The research plan developed during my involvement in another smaller project that I supported in the school. During that project, the school's SENCo shared that enabling the communication of their students with SLD was a priority for the school. This had been identified as a focus through a recent peer review process. Therefore, we agreed that the current research would be an appropriate and helpful way forward to meet the development needs of the

school. The school was using various interventions to meet the student's needs, with Intensive Interaction (Nind & Hewit, 1994, 2001; Caldwell, 2008) forming the core of their practice.

3.5.2 Student participants

Three students were identified by school staff to form nested case studies within the broader intervention context. School staff were asked to meet the following inclusion criteria when selecting student participants:

- aged 11-15 years;
- has a diagnosis of ASD;
- has severe learning difficulties;
- currently shows low levels of initiated or spontaneous communication and therefore likely to benefit from the intervention; and
- has good school attendance.

Additional details regarding student characteristics and baseline communicative skills was collected as described below and summarised in Table 3.

1. School paperwork was consulted, particularly Mapping and Assessing Personal Progress (MAPP) expressive language targets. This information is displayed in column 3 of Table 3.
2. Information was gathered through discussion with staff using the questionnaire regarding function, quantity and method of spontaneous communication (Appendix E). This information is displayed in columns 4 and 5 of Table 3.
3. Information was collated to assign each student a 'best fit' skill level using Mar and Sal's (1999) communication profile descriptors (Appendix F). This information is displayed in column 6 of Table 3.

Table 3: Student baseline communicative skills

1. Student	2. Age	3. MAPP expressive language targets	4. Methods used	5. Functions served	6. Skill level
Adam	13 years 6 months	To use motivational PECS to communicate his wants 25% of the time	Action, gesture, vocalisation, some Makaton, some single words	Requesting objects, protesting, requesting social routine, emerging commenting	L4
Billy	11 years 9 months	To show enjoyment when interacting with a familiar adult for up to 1 minute	Action	Requesting objects, protesting, requesting social routine	L2
Charlie	12 years 9 months	To use PECS phase 4 'I want' strips to request motivating items 25% of the time	Action, gesture, some single words	Requesting objects, protesting, requesting social routine	L3

3.5.3 Staff participants

All staff working with the three student participants were invited to attend the training sessions and take part in the project. Once the project was fully underway, three members of staff became more closely involved and formed a core group, each with a particular focus on working with and monitoring the progress of one of the students. One was a class teacher and two were higher level teaching assistants (HLTAs). Basic staff participant characteristics are detailed below alongside their link student. (The pseudonym of the staff participant begins with the same letter as the pseudonym of the student to enhance the readability of the findings section.)

Table 4: Staff characteristics and link student

Adult	Sex	Professional role	Link student
Anna	Female	HLTA	Adam
Ben	Male	Class Teacher	Billy
Charlotte	Female	HLTA	Charlie

3.6 Intervention Procedure

The current study was planned as a conceptual replication (Coyne et al., 2016) of the original study (Kossyvaki, 2017). A conceptual replication seeks to apply the original study's 'concept' in contexts, settings and conditions that differ from those in the original study and is aligned with the critical realist 'what works' agenda in education (Morrison, 2022). Clarity in defining the 'concept' is important in order to understand the 'what' in 'what works' (Morrison, 2022).

3.6.1. The 'concept'

Kossyvaki (2017) uses the term Adult Interactive Style Intervention (AISI) to refer to the 13 general communicative principles and 8 communicative opportunities distilled from the literature, that comprise the strategies being implemented. However, I was drawn to the process of her work as well as the strategies themselves. Therefore, when I use the term Adult Interactive Style Intervention, I am referring to the broader intervention procedure as well, which includes the following steps:

1. Staff are videoed naturally interacting with the students across different activities.
2. The facilitator edits and shares the pre-intervention videos during group training sessions to highlight strengths and good practice, illustrating the 13 general principles and 8 communicative opportunities distilled from the autism intervention literature.
3. Staff trial the strategies over several weeks and are facilitated to reflect on them.
4. The researcher and staff collaboratively decide which strategies to implement during the strategy implementation phase.
5. Staff implement strategies as often as possible, naturalistically within the school day.

3.6.2 This Adult Interactive Style Intervention

Although this study sought to apply the original study's 'concept,' there are significant differences between this Adult Interactive Style Intervention and the original study. This is because collaboration forms part of the 'concept' but also part of the action research methodology of this study, contributing to the complex system (Luttenberg et al., 2017) that determines the processes, procedures and

outcomes of the intervention. As the methodology of this study is integral to the intervention procedure, the procedure is presented using an action research cycle.

Thomas (2017) describes five steps that take place through each action research cycle:

- have an idea or see a problem;
- examine the idea or problem and gather information about it;
- plan action;
- take action; and
- reflect on the consequences.

Importantly, action research is a flexible design that involves a combination of ongoing collaborative reflection-in-action as well as formal data gathering for reflection-on-action (Cohen et al., 2018). The action research cycle below aims to reflect this. It provides an auditable and transparent account of collaborative decisions made during this project, combined with the data gathering sequence, to give an overview of this Adult Interactive Style Intervention.

Table 5: Intervention procedure and data collected during action research cycle

Have an idea or see a problem (Autumn Term, 2021)	Data Collected
• The school identified that enabling their students with autism and SLD to spontaneously make their wants and needs known was an area they wanted to focus on developing. • My research interests were aligned with this and having recently read about the success of Kossyvaki's (2017) Adult Interactive Style Intervention for young autistic children, I proposed that something similar might be a helpful way forward. • Following a presentation on what the project might look like, the SENCo and I planned for the project to begin later in the year, once ethical approval was granted.	N/A
Examine the idea or problem, gather information about it and plan action (Spring Term, 2022)	**Data Collected**
• I conducted a preliminary literature review, consolidated my knowledge of Kossyvaki's (2017) findings and discussed the project with Speech and Language colleagues. • I liaised with the school's Autism Lead and visited regularly to get to know the students and staff better.	Pre intervention video data to code the students' spontaneous communication

• Once ethical approval was granted, the school identified three student participants. Information regarding the baseline communicative skills of the student participants was gathered (see 3.5.2 and *adjacent Note)* • The Autism Lead and I defined the primary outcome we hoped to achieve as - increased quantity of spontaneous communication in the students. We discussed and planned aspects of data collection together (3.7). • Video footage of the staff and student participants was taken, in order to collect pre-intervention data on students' spontaneous communication and gather footage for training sessions. • The Autism Lead and I looked at footage together to identify what was working well to enable spontaneous communication. Application of the general principles and some communicative opportunities as defined by Kossyvaki (2017) could be identified, with plenty of good practice to celebrate and build on. The Autism Lead commented that many of the general principles as specified by Kossyvaki (2017) were embedded in their interactive style already as Intensive Interaction formed a large part of their practice. • The Autism Lead and I planned and agreed the action stage below.	*(Note:* I was planning to use the 'Questionnaire regarding quantity, function and method of spontaneous communication in students' (Appendix E) as a pre and post measure. However, staff did not have a clear understanding of what we were hoping to achieve pre- training, therefore, using this quantitatively felt unreliable. Instead the questionnaire was used as a visual aid to gather qualitative baseline details and as a prompt for discussion during semi structured interviews.)
Take action (Summer Term, 2022)	Data Collected
• I delivered three training sessions for staff (Appendix G). • I introduced the collaborative nature of the project, and we discussed what communication means to them. I introduced the idea of spontaneity as a continuum related to antecedent prompts. I shared a summary of the cognitive, psychological, and sensory processing challenges complicating communication development in students with autism. • Examples of Kossyvaki's (2017) general principles and communicative opportunities that were captured during pre-intervention filming were illustrated using video footage. Staff were facilitated to discuss what works well for them, to reflect on top-down evidence shared from the literature and bottom-up evidence gathered from their practice, with reference to specific examples. • Staff were facilitated to choose a set of strategies from those developed by Kossyvaki (2017) that they would like to implement and they decided to focus specifically on communicative opportunities rather than the general principles. • Based on discussion during training sessions, these were reduced from 8 communicative opportunities implemented by Kossyvaki	Check-in questionnaire completed by staff to identify how regularly strategies were used Researcher diary notes

(2017) to 6 communicative opportunities to be implemented in this Adult Interactive Style Intervention. (1) Give a choice of activity, equipment or food (2) Stop part-way through an enjoyable activity (3) Give small portions of materials/ snacks (4) Make items visible yet inaccessible (5) Give materials the student will need help with (6) Contradict expectations • Concrete examples of the application of these strategies in practice, noticed during filming or shared by staff in training sessions, were collated (Appendix H). • Staff were asked to implement these strategies as often as possible in their practice for five weeks. • Based on discussion with staff around the need for an individualised approach, the original group of staff involved was reduced to three key adults, each with a focus on one of the students. • Halfway through the five-week strategy implementation phase, each of the three staff engaged in a 30-minute supervision session (Hawkins & Shohet, 2012) to reflect on the process so far. These sessions met the educational and supportive functions of supervision to varying degrees, as determined by the supervisee. Discussion tended towards how their target student was getting on, what they felt was going well, and action points specific to each student/ staff dyad. This session also met the managerial function of supervision with a focus on intervention fidelity as staff were asked to complete a check-in questionnaire to identify how often they were using each strategy with their target student. (The move to working with dyads and incorporating a supervision session to support this was unplanned and arguably an adaptation to 'the concept' being replicated).	
Reflect on the consequences (Summer Term, 2022 & Autumn Term 2022)	Data Collected
• Data was gathered and analysed to answer the research questions.	Post intervention video data to record the students' spontaneous communication Post intervention semi-structured interviews with key staff

Have a revised idea (Autumn Term 2022)	Data Collected
• A revised idea for subsequent action research cycles was developed. This was not implemented within the scope of the agreed project but is included in recommendations for future research.	N/A

3.7 Data Collection

The data collected during the action research cycle outlined above was triangulated to address the research questions and is shown in Table 6. The four data collection methods and their development are discussed below.

Table 6: Data collection methods by question

Research Aim: How is the spontaneous communication of three young people with autism and SLD impacted by an Adult Interactive Style Intervention?	
Research Question	Method of Data Collection
1. Does the spontaneous communication of each student improve post-intervention?	Method 1: Pre and post intervention video data to code the students' spontaneous communication Method 2: Post intervention semi-structured interviews with key staff Method 4: Researcher diary notes
2. What are staff views regarding implementation of the agreed strategies?	Method 3: Check-in questionnaire completed by staff to identify how regularly strategies were used Method 2: Post intervention semi-structured interviews with key staff Method 4: Researcher diary notes
3. Which factors impacted the success of the intervention?	Method 2: Post intervention semi-structured interviews with key staff Method 4: Researcher diary notes

3.7.1 Method 1: Video observation

A measure of spontaneous communication in children with autism is best achieved using observation in a naturalistic setting (Clifford et al., 2010). Observation is considered to provide a more 'unfiltered' record of behaviour (Cohen et al., 2018) compared to indirect information provided by school staff - although still subjective and situated, in line with critical realist epistemology. Nonetheless, using video

to aid observation is highly advantageous as it allows the researcher to view behaviour multiple times (Heath et al., 2010), which is crucial when determining whether, what, and how a young person with SLD and autism is communicating.

A limitation of observation using video can be reactivity (Lee et al., 2017), which refers to those being observed changing their behaviour when filmed. This was mitigated in the current study as adults were put at ease by knowing that the video data collected was focused on the students. Additionally, the equipment used for filming (iPad) was commonly used for progress records in school and therefore not something students were likely to find unusual. Furthermore, students were carefully monitored by staff for ethical reasons. There was no indication from staff that filming significantly changed the students' communicative behaviour.

A greater limitation of observation using video is achieving representative data within a busy school environment. SCERTS (Prizant et al., 2006) guidance was referred to by Kossyvaki (2017), which outlines a 'gold standard' in relation to observation. SCERTS guidance (Prizant et al., 2006) recommends that a student is observed for two hours on two consecutive days, within at least two different group sizes, and undertaking a range of activities that vary along these continuums: structured versus unstructured, must do versus fun, adult directed versus child-directed, motor-based versus sedentary, familiar versus unfamiliar, preferred versus non-preferred, easy versus difficult, language-based versus non-language based, and busy versus calm. Previous studies have identified the structured versus unstructured continuum as important, albeit reporting mixed and inconclusive results in terms of which condition is likely to enable most spontaneous communication (Chiang, 2009; O'Reilly et al., 2005; Potter & Whittaker, 2001; Kossyvaki, 2017). Similar observation using video in previous studies has varied in length from 12 minutes per student (Birkeneder & Sparapani, 2022) to an hour per student (Hauck et al., 1995) to several hours per student (Chiang & Lin, 2008; Kossyvaki, 2017), to a whole day per student (Potter & Whittaker, 2001). Extensive videoing can be challenging to achieve because videoing needs to fit within the possibilities and constraints of the school setting, in order to respect participant time and classroom commitments (BERA, 2018).

A strategy for meaningful data collection without imposing additional demands on staff was developed in consultation with the Autism Lead. This had to be opportunistic, flexible, time restricted, ethical and comparable pre and post intervention. A two-stage approach to the collection of video observation data

was agreed. The first stage involved gathering video footage and matching this pre and post-intervention within participant based on the nature of the activity, and the second stage involved coding the raw data.

During stage 1, the Leuven Scale (Laevers, 2005; Appendix D), was used to ensure that video footage was gathered when the students were likely to be at their most communicative. This was for ethical reasons, as previously discussed, but also in order to capture the students 'at their best' *both* pre and post intervention. We agreed that it was appropriate to film when students displayed level three (moderate) or above for both wellbeing and engagement. We also agreed that I would be on site for approximately three mornings pre-intervention and post-intervention to gather as much video data of the three students as possible within this timeframe. Data was gathered opportunistically, within these parameters, rather than specific activities being agreed in advance. This was necessary as planned activities and their duration varied significantly from day to day based on the wellbeing of the students. Therefore, the rationale on what to film, and for how long, was primarily determined by the students' engagement and wellbeing, whilst trying to capture a range of activities in line with SCERTS guidance (Prizant et al., 2006).

Filming for all student participants rarely lasted for extended periods of time and tended to be short one-to-two-minute clips in order to meet the Leuven Scale criteria. Although pre-intervention video data was collected for all three students, post-intervention video data could only be collected for two student participants (Adam & Billy) as the third participant (Charlie) did not meet the Leuven Scale wellbeing and engagement threshold established for video data collection at the time of filming. Although Charlie's pre-intervention video was used for training purposes, his spontaneous communication was not coded as there was no post-intervention data available for comparison. Furthermore, post-intervention filming coincided with the heatwave in July 2022, which significantly impacted student attendance and wellbeing. Therefore, less data was collected post-intervention for Adam and Billy than pre-intervention. *All* post-intervention video footage collected for Adam and Billy was matched within-participant to pre-intervention video based on the nature of the activity (structured and adult-directed versus unstructured and child-directed), with reference to SCERTS guidance (Prizant et al., 2006), and then coded.

Table 7: Summary of video data coded pre and post intervention

Student	Leuven Criteria Level Three	Pre - Intervention			Post - Intervention		
		Structured adult-led activities	Unstructured student-led activities	Total time	Structured adult-led activities	Unstructured student-led activities	Total time
Adam	Met	Individual desk work (8 min)	Outside equipment (6 min)	14 min	Group learning supported individually (8 min)	Outside equipment and indoor choosing (6 min)	14 min
Billy	Met	Individual desk work, group learning supported individually (10 min)	Snack time (2 min)	12 min	individual desk work, group learning supported individually (10 min)	Snack time (2 min)	12 min

During stage 2, the video footage shown in Table 7 was coded using a structured observation schedule (Appendix I) with partial interval sampling at 15 second intervals. Each 15 second interval of footage was watched multiple times to ascertain whether the student displayed spontaneous communication at any point during the interval. If so, this was coded to capture the overall quantity of spontaneous communication observed as well as the functions and methods used. Initial coding showed that partial interval sampling captured the students' communicative patterns whilst accounting for time and resource limitations. However, compared to event sampling, where every communicative act is coded, partial interval coding did not fully reflect the frequency of spontaneous communicative acts, particularly for Billy. Additionally, occasionally a student exhibited several acts of spontaneous communication within a 15 second interval that differed in terms of function or method. In these few cases, the dominant communicative act for that interval was coded, determined by the duration of the act.

Codes in a structured observation schedule should be mutually exclusive, comprehensive, complete, relevant, observable, unambiguous, self-evident and easy to record (Denscombe, 2017). To this end, several decisions were made and definitions clarified.

Communication was defined as an act where there is a message/ something to communicate about, a sender, a receiver, a medium of transmission, and communicative intent (Bogdashina, 2022). A continuum understanding of spontaneity was adopted, where it is acknowledged that each communicative act has a degree of spontaneity with contextual and environmental stimuli such as prompts, instructions and verbal cues ranging from having a minimal to a most intrusive impact on the speaker. However, in order to operationalise 'spontaneity' for measurement purposes, the Autism Lead and I referred to Carter and Hotchkis' Four Level Antecedent Hierarchy (2002) and agreed that antecedent levels 4 (natural cues), 3 (stimulus highlighting) and 2 (generalised communicative cue) would be considered spontaneous communication whereas level 1 (direct prompting) would not. Therefore, the definition adopted for spontaneous communication in this study is - Communication that occurs in the absence of prompts that directly elicit a specific communicative act by the learner and specify the content and/ or form of the act.

The Modified Classroom Observation Schedule to Measure Intentional Communication (M-COSMIC, Clifford et al., 2010) was used to ensure that categories for *function* of spontaneous communication and *method* of spontaneous communication were comprehensive, complete and observable. Descriptions provided by the authors (Clifford et al., 2010) were referred to carefully to assist interpretation (Appendix J). Clifford et al., (2010) reported strong ecological validity, inter-coder reliability and specificity of their measure but this study was conducted with young children no older than five. Therefore, to ensure the schedule could comprehensively capture the complete range of observable communicative behaviours of the students in the current study, two member of school staff were consulted, but no alterations were suggested.

Even with clear definitions and categories, interpreting complex communicative behaviours in practice is not unambiguous or self-evident. Cohen et al., (2018) highlight the importance of the researcher having expertise and suitable experience to make sense of the material observed. Therefore, following initial filming, I consulted the school's Autism Lead, who knew the students well, to ensure my interpretation aligned with hers. Furthermore, as an advantage of observation data is its openness to investigator triangulation and scrutiny by others (Heath et al., 2010), an inter-rater reliability check was undertaken. This was provided by an educational professional with experience of teaching secondary students with special educational needs. She was impartial and did not know the students. Prior to independent

coding, communicative functions and methods for each student were first discussed using film footage, as the coder needed to be familiar with the students' unique communicative behaviour. The coder then independently coded 2 minutes of previously unseen footage per child. The number of times we agreed across 4 minutes of data coding was divided by the number of possible opportunities to agree and multiplied by 100 (Watkins & Pacheco, 2000) to give a percentage agreement of 88%. Reichow et al. (2008) recommend an agreement rate of 80% or above. Disagreements were related to the function of the students' communication.

3.7.2 Method 2: Semi-structured interviews

Semi-structured interviews were used to collect staff views regarding all research questions. The interview schedule created (Appendix L) used open ended questions, providing a frame of reference for participants' answers without unduly influencing the response given. This allowed for rapport building, flexibility, greater meaning and depth, the clarification of misunderstandings, a truer assessment of what the participants really believe, and unanticipated answers to generate theory (Cohen et al., 2018). Open ended questions were particularly important in relation research question three. Closed questions were also used in order to test theory, and were particularly useful for research questions one and two. Member checking (Thomas, 2017) was used when appropriate to ensure that responses were interpreted as participants' intended, in order to reduce interviewer bias and social desirability effects. Triangulation of methods also went some way to reducing these limitations.

3.7.3 Method 3: Check-in questionnaire

A form was used during the individual supervision session to gather information about how regularly each strategy was being implemented (Appendix M). This was quick to complete, with minimal demands on staff. It provided clear information regarding staff perspective on how often the agreed strategies were implemented. Limited flexibility of response and related disadvantages of this method of data collection was reduced through triangulation with interview data.

3.7.4 Method 4: Researcher diary

Contextual information impacting the course of the intervention or impacting individual student progress was noted. A reflective journal is widely recommended in order to record rich contextual information (Phillippi & Lauderdale, 2018) and to strengthen the trustworthiness of analysis (El Hussein et al., 2015). Additionally, best explanation obtained from different contexts can shed light on the domains of the actual and the real (Mukumbang, 2021). When information gathered or reflections recorded in my research diary are drawn upon in findings, this is clearly presented as such.

3.8 Data Analysis

Quantitative and qualitative data were analysed separately and then triangulated for research question 1 (RQ1) and research question 2 (RQ2). Qualitative data was drawn on for research question 3 (RQ3).

3.8.1 Analysis of quantitative data

The video observation provided quantitative data to address RQ1. The check in questionnaire provided quantitative data to address RQ2. A critical realist philosophical position, action research case study methodology, and small sample size made it appropriate to analyse quantitative data using descriptive statistics only. Critical realism understands statistical analysis as misleading due to its inherent assumption that all relevant data are incorporated in the outcome, reducing social complexity to independent and dependent variables (Olsen & Morgan, 2005). Furthermore, in line with critical realist thinking, action research case study methodology emphasises depth and understanding over statistical generalisability (Thomas, 2017). Therefore, the video data was compared within student pre and post intervention, using percentages and totals, and triangulated with qualitative data. Specific examples of spontaneous communication noted during initial coding are also presented to illustrate the quantitative findings. The check in questionnaire data was collated between staff participants and triangulated with qualitative interview data to build a rich picture of the intervention strategies and their implementation.

3.8.2 Analysis of qualitative data

The semi-structured interviews with staff provided qualitative data to address all three research questions. A critical realist approach to thematic analysis (Fryer, 2022; Wiltshire & Ronkainen, 2021) was used. Critical realist approaches to thematic analysis are a relatively new development in the research

methods literature, building on the widely cited original process (Braun & Clarke, 2006), that has since moved towards a more interpretivist philosophical position (Braun & Clarke, 2019).

The key difference between the procedure initially described by Braun and Clarke (2006) and a critical realist approach to thematic analysis, is that analysis should move beyond the empirical domain, to address ontological depth. A key aspect of a critical realist approach is to ask questions around what enables, leads to, and generates observable phenomena (Wiltshire & Ronkainen, 2021). Critical realist thematic analysis can draw on the deductive, inductive and abductive logics of enquiry in post- positivist and interpretivist thinking, but also uses retroductive reasoning. The logic of retroduction refers to the process of building hypothetical structures and mechanisms that are assumed to produce empirical phenomena (Bhaskar, 2008). In other words, the aim of critical realist thematic analysis should be to make hypotheses about causal factors (Jagosh 2020).

I used deductive coding to analyse data on observable phenomena for RQ1 (What did staff share about student progress in spontaneous communication by quantity/ function/ method?) and RQ2 (What did staff share in relation to each of the six communicative opportunities?). I followed Fryer's (2022, Table 8) recommended steps for analysis of RQ3 (Which factors impacted the intervention?). Appendix N provides an example of how I coded transcripts across the three research questions. Appendix O provides an example of the development of a causal theme in answer to RQ3.

Table 8: A critical realist approach to thematic analysis (Fryer, 2022)

Steps	Recommended actions	My application
Step 1: Develop your research questions	Identify the experiences and/or events of interest, and develop one or more causal research questions	RQ1 and RQ2 address experiences and/or events of interest, namely student progress in terms of quantity/ function/ method of spontaneous communication and staff views on the implementation of communicative opportunities 1-6. I coded data relating to RQ1 and RQ2 deductively. RQ3 is a causal research question. I followed steps 2,3 and 4 exclusively for RQ3.
Step 2: Familiarise	Skim read a large proportion of the data	Having transcribed the audio files, I read through each one with RQ3 in mind.

Steps	Recommended actions	My application
yourself with the data	Make notes on initial thoughts and questions	I created a 'thoughts and questions' document as suggested by Fryer (2022), to write down initial thoughts, questions, associations, and surprises.
Step 3: Apply, develop and review codes	Apply descriptive codes to the data using a data-led approach	I used data-led coding to apply descriptive codes for RQ3.
	Develop these codes by processes of standardisation (use the same wording for similar codes) and consolidating (use theoretical terms to unite different codes)	Constant comparison was used to standardise codes. Theoretical terms were assigned. Wiltshire and Ronkainen (2021) describe this as moving from participants' subjective viewpoints and experiences, such as their intentions, hopes, concerns, feelings and beliefs, as they are evident in the data (empirical domain) to making inferences from empirical data using conceptual redescriptions and more abstract language (actual domain).
	Review codes by assessing their validity	I asked myself the following questions: • Do my codes accurately describe the data they have coded (descriptive validity)? • When I use theoretical terms to unite codes, do they continue to accurately reflect the experiences in the data (interpretive validity?)
Step 4: Develop and review themes	Develop themes (causal explanations of experiences/ events)	For Fryer (2022), a theme *is* a causal hypothesis. This is developed through retroductive reasoning, asking - what best explains the observable phenomena (student progress and staff implementation of strategies)? Participants own views regarding causation were important here as well as a latent approach to analysis, within the context of previous research and theory.
	Review themes by assessing their validity	I asked myself the following question: • In the context of previous research and theory, does this theme explain the observable phenomena of interest (explanatory power)?

<table>
<tr><th>Steps</th><th>Recommended actions</th><th colspan="2">My application</th></tr>
<tr><td rowspan="4">Step 5: Generate conclusions and reports</td><td rowspan="4">Consider how best to communicate the conclusions</td><td colspan="2">Following the advice of Wiltshire and Ronkainen (2021) I use distinct phrases to reflect the three ontological domains in order to improve clarity, transparency and auditability when communicating all conclusions. I use these phrases referring to the empirical and actual domains for RQ1 and RQ2, and in reference to the real domain for RQ3.</td></tr>
<tr><td>Ontological domain</td><td>Suggested phrasing</td></tr>
<tr><td>Empirical domain: Participants' subjective viewpoints and experiences, such as their intentions, hopes, concerns, feelings and beliefs, as they are evident in the data.</td><td>"N participants in this study believed/ felt..."</td></tr>
<tr><td>Actual domain: Makes or refers to inferences from empirical data using conceptual redescriptions and more abstract language.</td><td>"It is plausible to claim/ infer that..."</td></tr>
<tr><td></td><td></td><td>Real domain: Reference to theories about the properties and powers that may exist in order to produce the phenomena being studied.</td><td>"The phenomena/ event may be related to/ dependent upon..."</td></tr>
</table>

3.8.3 Presentation of findings

Following analysis, two key decisions were made regarding the organisation and presentation of findings:

- The findings and discussion are presented together.
- The findings and discussion chapter is organsied to maximise reader accessibility, rather than by research question.

I decided to present the results and discussion together as this is consistent with a critical realist approach to qualitative analysis. As critical realist thematic analysis (Fryer, 2022) draws on retroductive

reasoning, engagement with literature and theory is required in the development of causal themes. It is not possible to engage with step 4 (develop and review themes) in Table 8 without considering a theme's explanatory power in the context of previous knowledge and understanding. Therefore, separating results and discussion would be inconsistent with the process of analysis.

I decided to organise findings as presented in Table 9 rather than by research question for reader accessibility. The research questions are:

RQ1. Does the spontaneous communication of each student improve post- intervention?
RQ2. What are staff views regarding implementation of the agreed strategies?
RQ3. Which factors impacted the success of the intervention?

In answer to RQ3, critical realist thematic analysis highlighted a number of factors that impacted the intervention. Following data led coding, it became clear that the factors identified could be considered to exist, or be organised into, different levels: student factors, staff factors, process factors and school level factors. In order to present these in the most accessible and meaningful way, I first consider student outcomes (RQ1) and student level factors hypothesised to impact outcomes (RQ3), then staff views regarding the implementation of each strategy (RQ2) and staff level factors hypothesised to impact the implementation of strategies (RQ3), followed by process and school level factors hypothesised to also impact the success of the intervention (RQ3).

Table 9: Presentation of findings in relation to research questions

Findings and discussion section	Research question
4.1 Student outcomes and student level factors	RQ1 and RQ3
4.2 Implementation of strategies and staff level factors	RQ2 and RQ3
4.3 Process and school level factors	RQ3
4.4 Research aim	RQ1 and RQ2 and RQ3

CHAPTER 4: FINDINGS AND DISCUSSION

The findings of this study are presented in three sections, as illustrated in Table 9. The first section addresses student outcomes (RQ1) and student level factors impacting outcomes (RQ3). The second section addresses staff views regarding the implementation of strategies (RQ2) and staff level factors impacting the implementation of strategies (RQ3). The third section addresses process factors and school level factors that impacted the intervention (RQ3). The three sections are drawn together in the conclusion to address the research aim, which is to find out how the spontaneous communication of three young people with autism and SLD is impacted by this Adult Interactive Style Intervention.

4.1 Student outcomes and student level factors

This section addresses RQ1 - Does the spontaneous communication of each student improve post-intervention? It also addresses student level factors identified in answer to RQ3 - Which factors impacted the success of the intervention? In other words, this section presents data related to student outcomes and student level factors hypothesised to impact outcomes.

In recognition of the heterogeneity of autistic students with SLD, and to highlight each nested case within the broader intervention case study, this section is presented individually by student, firstly Adam (supported by Anna), then Billy (supported by Ben), and lastly Charlie (supported by Charlotte). Each section begins with a pen portrait of the young person, including baseline information and relevant individual contextual factors recorded in my research diary. It then moves on to address RQ1, presenting deductively analysed staff interview data followed by video observation data, both highlighting change in spontaneous communication by quantity, function and methods used. The following function and method categories are used across qualitative and quantitative data, (with further explanation of each available in Appendix J):

Function categories:

- Behaviour Regulation - requesting objects, refusing or protesting
- Dyadic Joint Attention - requesting social routine, seeking attention, acknowledgement
- Triadic Joint Attention - commenting, requesting information

Method categories:

- Pre- symbolic - Vocalisation, action, gestures
- Symbolic - Symbols, speech

Simply understood, any increase in the quantity of spontaneous communication, a broadening of functions from behaviour regulation towards dyadic and triadic joint attention, or a broadening of methods from pre-symbolic to symbolic language is likely to indicate improvement. However, what constitutes an improvement in spontaneous communication for a particular student is best understood in context. Qualitative and quantitative data is then triangulated to provide a summary of progress for each young person and to answer RQ1.

Following a summary of progress, student level factors identified for RQ3 are discussed. Critical realist thematic analysis (Fryer, 2022) identified individual differences as a key factor impacting the success of the intervention. All three staff spoke extensively about the students being *"individually so different*" (Charlotte), with their unique needs impacting implementation and outcomes. Drawing on progress data, retroductive analysis of staff interview data and contextual information, a key individual difference impacting the progress of each student is hypothesised.

4.1.1 Adam

Adam is a calm young man who enjoys watching cartoons on his laptop. Baseline information gathered showed that Adam uses action, gesture and vocalisation to communicate spontaneously, as well as some Makaton/ symbols with significant prompting. Adam communicates to request objects, protest, request social routine such as comfort, and he displays some emerging commenting. He has a best fit communication level of 4 (Mar & Sal, 1999, Appendix F), meaning that Adam's spontaneous communication is pre-symbolic to symbolic, involves single behaviours or acts, and he displays basic intent and early reciprocity.

Staff shared that prior to the intervention, Adam experienced high levels of anxiety in a small class setting of six students, therefore he was being individually supported in a separate room, without other students, at the start of the project. This provision had a positive impact on his wellbeing and Adam was being reintegrated back into his small class setting of six students with individual support during the

course of the intervention. The transition was positive and by the end of the intervention, Adam was settled in the classroom setting. His school attendance was high throughout the intervention. Adam's link adult, Anna, was his TA in both settings. Charlotte saw him occasionally but did not work with him directly, and Ben rarely saw Adam. Anna reported that "*he's very happy. This could be the honeymoon period, but he's doing really well so far*."

4.1.1.1 Interview with staff

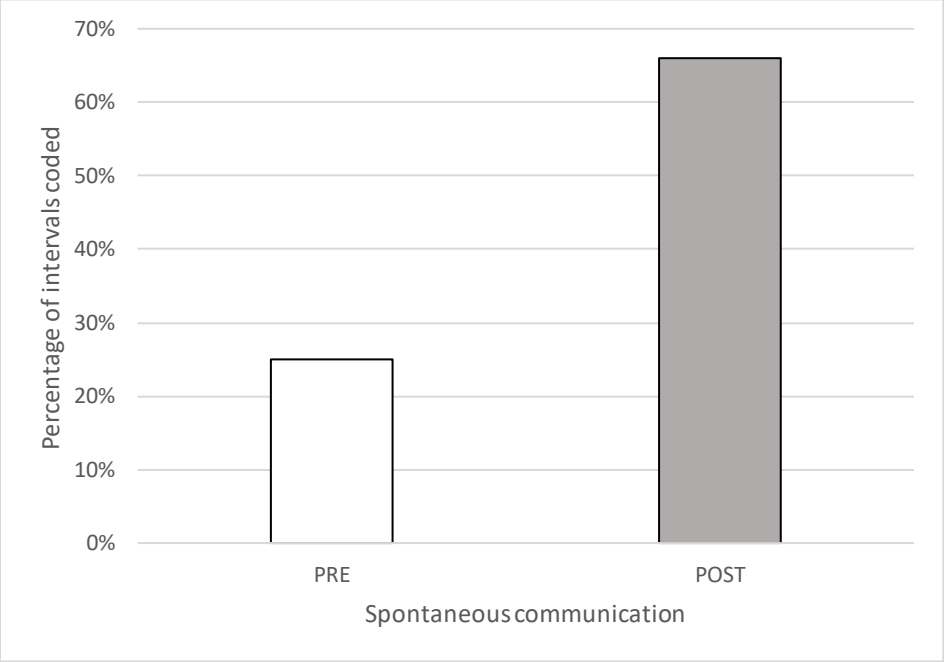
The following comments were made by staff regarding Adam's spontaneous communication post-intervention. The comments suggest an overall improvement, making particular reference to increased requesting (function) and increased use of speech (method).

"Seeing his communication and how he is around other students, around other staff members, it's been fantastic to see." (Charlotte)
"He's shown some independence and he's telling us what he wants. And he reacts vocally, which is what we want. So that is good as well." (Anna)
"So if he wants more food then he has to request it. And he will request it, whether it's gestures or 'mu', that's a sign for please. So that I would say that has increased since the last time we spoke… Yes he does that (request object) quite a lot now." (Anna)

4.1.1.2 Video observation

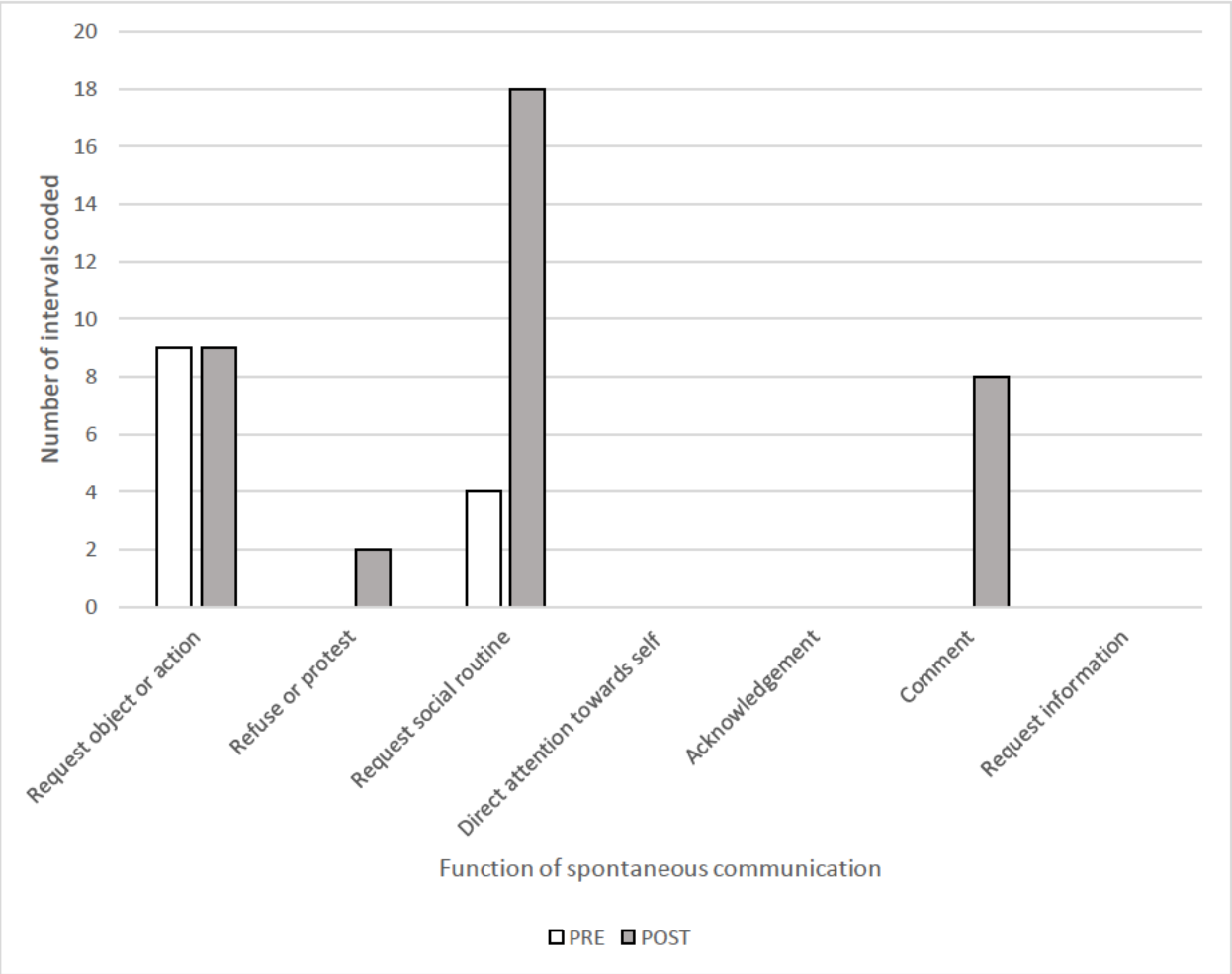
The total percentage of spontaneous communication coded pre and post intervention is displayed in Figure 2. Pre-intervention, Adam displayed spontaneous communication in 25% of the 15 second intervals coded. Post- intervention Adam displayed spontaneous communication in 66% of the 15 second intervals coded.

Figure 2: Percentage of 15 second intervals coded for spontaneous communication pre and post intervention for Adam



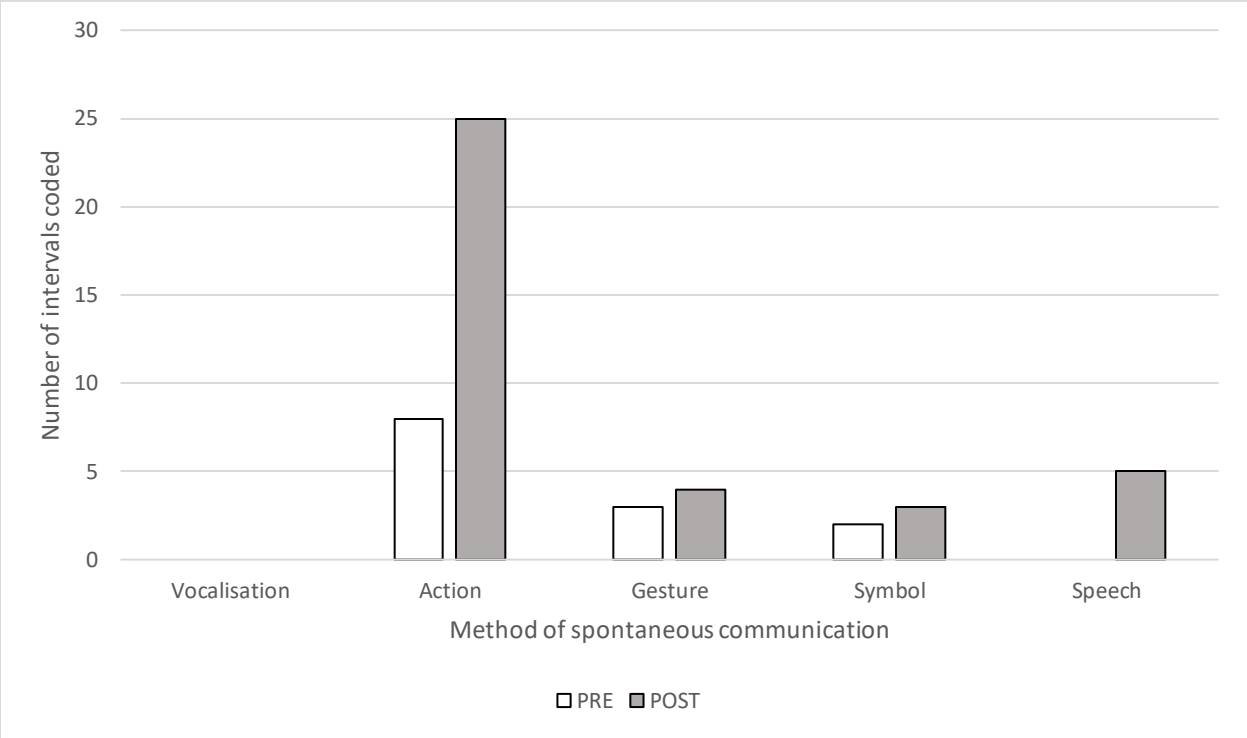
The function of the spontaneous communication coded pre and post intervention is displayed in Figure 3. The breadth of functions, or purposes, for which Adam engaged in spontaneous communication increased from requesting an object and requesting social routine to also refusing and commenting. The greatest change was in requesting social routine, which increased from 4 coded intervals pre-intervention to 18 post-intervention. Initial coding shows that pre-intervention, Adam's requests for social routine were largely seeking comfort from an adult, such as hand holding, whereas post-intervention this also included requesting 'more' interpersonal engagement, such as being chased or rocked. Another key change was in commenting post- intervention, which requires triadic joint attention. Initial coding shows that Adam showed increased triadic joint attention post- intervention, such as communicating anticipation and excitement to an adult regarding the popping of a water balloon.

Figure 3: Number of 15 second intervals coded pre and post intervention by function of spontaneous communication for Adam



The method of the spontaneous communication coded pre and post intervention is displayed in Figure 4. The breadth of methods, or ways, in which Adam engaged in spontaneous communication increased from action, gesture and some use of symbols, to include speech. The greatest change was in Adam's preferred method of communication, action, which increased from 8 coded intervals pre- intervention to 25 post-intervention. Another key change was in the use of speech, which increased from 0 coded intervals pre intervention to 5 coded intervals post-intervention. Initial coding shows that Adam used 'dor' to indicate 'more,' and 'du' for 'you' or turn taking.

Figure 4: Number of 15 second intervals coded pre and post intervention by method of spontaneous communication for Adam



4.1.1.3 Summary of progress

Video data and interview data suggest that the total quantity of spontaneous communication Adam engaged in increased post- intervention. An increase in requesting objects/ actions was noted in qualitative data, and quantitative data highlighted an increase in requests for social routine and commenting. Video and interview data both highlight an increase in speech being used as a method for communication. It is plausible to infer that Adam's spontaneous communication improved post-intervention.

4.1.1.4 Student level factor: baseline communicative ability

Improvement following intervention may relate to individual differences in baseline communicative ability. Adam was the most skillful communicator at the start of the intervention and staff described him

as the most cognitively able student participant. As explained previously, the communicative opportunities implemented are found across behavioural and developmental interventions but are more closely aligned with a behaviourist approach. Sherer and Schreibman (2005) and Stoelb et al. (2004) found that interventions based on behaviourist principles are more effective for autistic children who are communicatively more able, responsive and have developed joint attention skills; whereas interventions based on relational principles (e.g. Intensive Interaction) are preferred by practitioners for those children who have not yet developed skills in joint attention or initiation (Charman & Stone, 2008). In Kossyvaki's (2017) study, the degree of improvement in spontaneous communication was not related to baseline communicative ability across all pupils, but the child who had the most advanced communication skills, including some language (David), was considered by staff to have made the most progress. However, comparison is difficult, as staff in the original Adult Interactive Style Intervention used general principles more often than communicative opportunities. Nonetheless, in the context of previous research, it seems plausible to hypothesise that one factor impacting Adam's progress was his pre-existing communicative ability, particularly a capacity for shared attention.

4.1.2 Billy

Billy is a cheerful young man who enjoys moving around the classroom, making contact with adults, shaking favourite objects such as his walkie talkie, and watching Lion King You Tube clips. Baseline information gathered showed that Billy uses action spontaneously in order to gain adult attention and request social routine, as well as requesting objects and protesting. He has a best fit communication level of 2 (Mar & Sal, 1999, Appendix F), meaning that Billy's spontaneous communication is pre-symbolic, reactive and involves simple and specific behaviours (tapping the shoulders of adults) for a range of functions.

Staff shared that Billy was generally settled and attending regularly throughout the project. He was in a small class environment of four students with individual adult support. During the project, he transitioned to a new classroom with a different combination of four children. His link adult throughout the project, Ben, was his class teacher in both classrooms. Charlotte was a TA in his class, and Anna rarely saw Billy. Ben reported positively on his transition and behaviour: "*Do you know what, he's done incredibly well throughout the year. We had a little bit of difficulties last week with managing his behaviour but that's to do with other factors that we have no control over, the parents have no control*

over (referring to puberty). Other than last week, and it was really two days last week, his behaviour is much, much more settled. He's much more aware of the routine."

4.1.2.1 Interview with staff

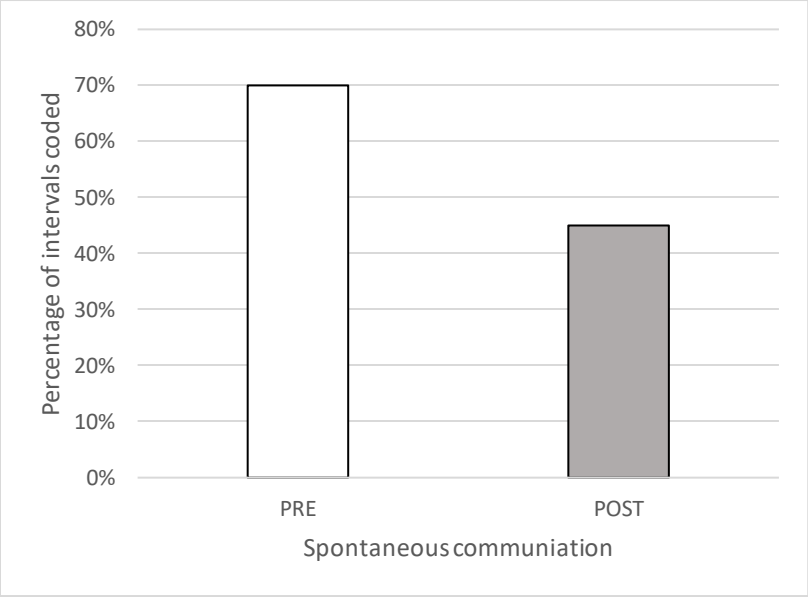
The following comments were made by staff regarding the spontaneous communication of Billy post-intervention. The comments suggest some positive change, making particular reference to increased use of symbols (method).

"Yes, I don't think there's been any significant change.... The quantity, I don't think he's doing it more frequently. What I think he's doing, as we mentioned before, is I think with familiar members of staff, I think he's using the pictures, tapping them, and showing that he wants something but without being quite specific about what it is that he wants." (Ben)
"We've got him to the point where he's now started to go to the symbols around the classroom and point, and then if we're not responding, then he might come back to us and grab our hands. But at least his initial processing now is to go to the symbol first for, be it, toilet or computer." (Ben)
"Now, we don't have to just automatically take him to the toilet. He will go to the door, tap the toilet, and then we know he needs the toilet." (Charlotte)

4.1.2.2 Video observation

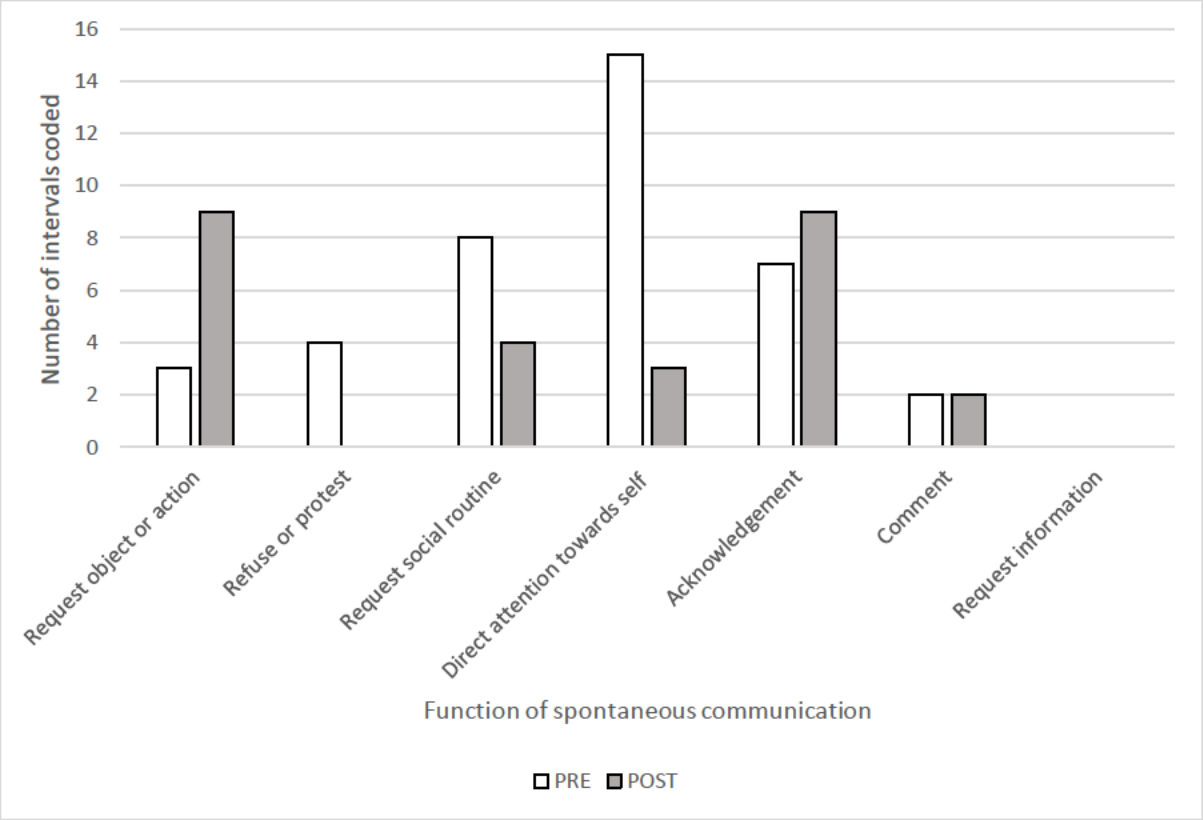
The total percentage of spontaneous communication coded pre and post intervention is displayed in Figure 5. Pre-intervention, Billy displayed spontaneous communication in 70% of the 15 second intervals coded. Post- intervention Billy displayed spontaneous communication in 45% of the 15 second intervals coded.

Figure 5: Percentage of 15 second intervals coded for spontaneous communication pre and post intervention for Billy



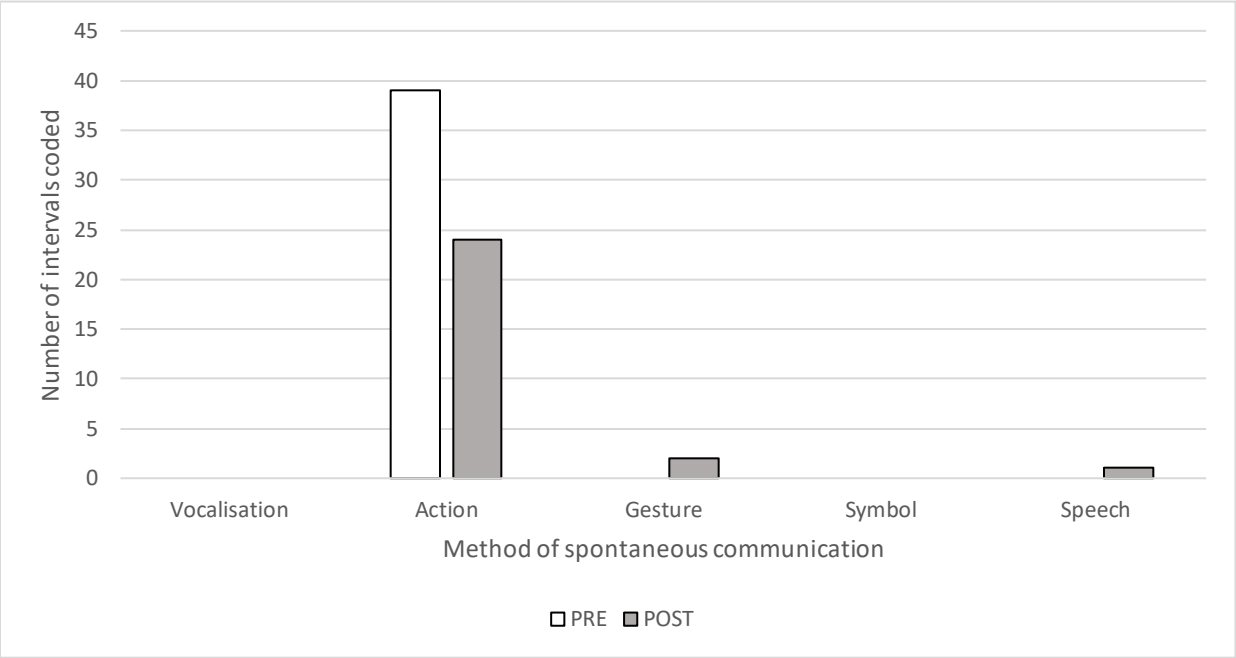
The function of the spontaneous communication coded pre and post intervention is displayed in Figure 6. The breadth of functions, or purposes, for which Billy engaged in spontaneous communication remained similar. The greatest change was in directing attention towards himself or seeking attention, which decreased from 15 coded intervals pre-intervention to 3 post-intervention. Initial coding shows that Billy often engaged in tapping adults' shoulders and extended eye contact to seek connection, particularly during structured and adult led activities. The other notable decrease was in requesting social routine, from 8 coded intervals pre-intervention to 4 coded intervals post-intervention, which is a function that also falls under the umbrella of dyadic social interaction. The greatest increase was in requesting an object or action, from 3 coded intervals pre-intervention to 9 post-intervention. Initial coding shows that requests pre-intervention were for video clips on You Tube, and requests post-intervention included requests for video clips on You Tube, more snack, and toilet.

Figure 6: Number of 15 second intervals coded pre and post intervention by function of spontaneous communication for Billy



The method of the spontaneous communication coded pre and post intervention is displayed in Figure 7. The breadth of methods, or ways, in which Billy engaged in spontaneous communication increased from action to include some gesture and an instance of speech, saying 'Yeah' in acknowledgement. Pointing at picture symbols, without specificity over which symbol was being pointed at, was coded as gesture.

Figure 7: Number of 15 second intervals coded pre and post intervention by method of spontaneous communication for Billy



4.1.2.3 Summary of progress

Video data and interview data suggest that the total quantity of spontaneous communication Billy engaged in did not increase post- intervention, with quantitative analysis indicating it decreased from a total of 70% of intervals coded to 50%. Video and interview data also suggest a change in specific functions, with notably decreased dyadic social interaction (seeking attention and social routine) as well as decreased protesting. Video and interview data suggests increased requesting with some progress towards using symbolic methods to do this. Whereas Adam's spontaneous communication clearly improved post- intervention, Billy's data paints a more complex picture. It is plausible to infer that Billy's spontaneous communication showed some improvement post- intervention.

Billy's spontaneous communication for requesting using symbols improved post- intervention. He was beginning to use symbols to request toilet, snack and computer. However, being in the early stages of using symbolic representations, the extent of this improvement may not have been captured in the video data. The importance of regular modelling is essential when teaching students to use AAC (Biggs

et al., 2018) and the definition of spontaneous communication adopted in this project based on Carter and Hotchkis' Four Level Antecedent Hierarchy (2002) was 'communication that occurs in the absence of prompts that directly elicit a specific communicative act by the learner and specify the content and/ or form of the act'. Therefore, as Billy was operating at the lowest end of the continuum of spontaneity for this particular skill, staff often found themselves modelling and specifying the content of this communicative act for Billy. Therefore, it is plausible to infer that in requiring the highest level of prompting to learn a new skill, before progressing further along the continuum of spontaneity, video data did not capture the full extent of Billy's progress in using symbolic methods for spontaneous communication, which came through more clearly in qualitative data.

4.1.2.4 Student level factor: baseline communicative profile

Changes following intervention may be related to individual differences in baseline communicative profile. The total quantity of spontaneous communication Billy engaged in stayed the same according to qualitative data or reduced according to quantitative data. Of particular interest, was a decrease in dyadic social interaction (seeking attention/ requesting social routine) and protesting. This decline in spontaneous communication can be better understood in the context of Billy's communicative profile. Billy often sought connection with adults by tapping their shoulders, sometimes very hard and often to reject adult directed learning activities. Therefore, a focus for staff was to expand Billy's methods of communication beyond tapping, and to work on other functions such as requesting. Although all spontaneous communication should be valued, and importantly there is no 'cut off' for 'correct' levels of spontaneous communication, Chiang and Carter (2008) make the point that some autistic individuals may be too spontaneous in their communication *in a given context* to be conventionally acceptable or to functionally meet the needs of the student. Kossyvaki (2017) also reported least progress following intervention for the child who showed the highest level of spontaneous communication pre-intervention. Therefore, in the context of previous research, it seems plausible to hypothesise that one factor impacting Billy's progress was his pre-existing communicative profile, particularly the high level of spontaneous dyadic communication he displayed.

4.1.3 Charlie

Charlie is an enthusiastic young man who enjoys sensory learning. He concentrates intently on activities that he loves, such as messy play with sand, water or paint. Researcher notes indicate that Charlie displays sensory seeking needs, he explores objects with his mouth, and he also experiences significant hypersensitivity to sound. Charlie often covers his ears but does not like to wear ear defenders. Baseline information gathered showed that Charlie communicates spontaneously using action, some gesture and occasional single words. His words can aptly capture his message, e.g. swearing to refuse. Charlie communicates to request objects, protest, or request social routine, such as having his feet rubbed. He has a best fit communication level of 3 (Mar & Sal, 1999, Appendix F), meaning that Charlie's spontaneous communication is mostly pre-symbolic with occasional conventional symbols (words), involves single behaviours or acts, and he is aware that his communicative behaviours impact others actions.

Staff shared that Charlie experienced a high level of distress which coincided with but was not caused by the project. He was placed on a part-time timetable and an alternative school placement was being considered. He experienced sensory needs that were highly motivating and overwhelming for him. Staff shared that he benefitted most from time alone outside and he appeared increasingly dysregulated by sounds. Ben was his class teacher. His link adult throughout the project, Charlotte, was his TA and she worked very closely with him. Anna did not have much contact with Charlie. Charlotte shared that "*he's now on a two-hour timetable and is even really struggling with that, it is very rare that we will have any engagement… He's just struggling with the space and surroundings… He likes the air on his body, he likes a sensory touch on his body from different materials. He just wants to be on his own, free."* Charlotte also shared that because Charlie was no longer permitted to transition around school, for safety reasons, this was significantly impacting his wellbeing, *"now our sensory circuit happens in our classroom as well as our morning routine happens in our classroom, and it's just too much for him to deal with because he can't leave our classroom."*

4.1.3.1 Interview with staff

The following comments were made by staff regarding the spontaneous communication of Charlie post-intervention. The comments suggest negative change, making particular reference to increased distressed behaviour (method) as opposed to a broader range of action, gesture and some speech used previously, as well as fewer requests for social routine (function).

“There’s more negative communication because he’s becoming a lot more distressed. Whether that could be due to the materials, to the day, to how he’s feeling. It’s more negative than positive that we’ve had off him recently.” (Charlotte)
“We haven’t had much of that (requests to have feet rubbed) recently at all. Not much of any tactile or any sensory feel sensology with him, because he’s not… Because of the two hours that he’s in… He’s started to go do his morning routine here and then go to forest school, because he likes the outdoor.” (Charlotte)
“No, I don't think anything’s changed at all from there (functions) other than obviously the less social routine.” (Charlotte)

4.1.3.2 Video observation

Video footage of Charlie was taken pre-intervention but not post- intervention, as he did not meet the Leuven Scale criteria (Laevers, 2005, Appendix D) for wellbeing or engagement at the time. The Leuven Scale criteria is a five-point scale based on observation. When there are high levels of wellbeing and engagement, learning and communication are likely to be optimal. The students were required to be at level 3 or above to be filmed. This cut off point was chosen to ensure both ethical practice and representative data pre and post intervention, catching students at their best.

4.1.3.3 Summary of progress

Without video data, findings are not triangulated, but staff indicated a narrowing of methods to distressed behaviour and a narrowing of functions to protest or communicating upset. Although distressed behaviour or behaviour that challenges is understood as a form of spontaneous communication that has a clear function (Chiang, 2008b), based on the data available, it is plausible to infer that Charlie’s spontaneous communication did not improve post intervention.

4.1.3.4 Student level factor: sensory differences

It is important, particularly in the field of special education, to report negative findings (Bryan et al., 2017). In line with a critical realist ‘what works’ agenda, we want to investigate what works, for whom,

in which circumstances (Pawson & Tilley, 1997) and part of this is understanding when and why something does not work.

Changes that coincided with the intervention may be related to significant unmet sensory processing needs. Bogdashina (2022) highlights the importance of sensory processing differences in language acquisition and Dunn et al. (2002) discuss the importance of ensuring that a child's sensory profile is understood prior to starting any intervention. Haskins (2022) investigated the impact of perceptual load in naturalistic environments and found that reductions in social attention are magnified by increased perceptual load, highlighting the connection between social communication and sensory processing in autism. Additionally, the association between hyperresponsiveness, increased anxiety and behaviour that challenges is established in the literature (Williams et al., 2021). Prince- Hughes (2004), an autistic adult, illustrates this by writing:

> So much stimulation streams in, rushing into one's body without ever being processed: the filters that other people have simply aren't there. Swimming through the din of the fractured and the unexpected, one feels as if one were drowning in an ocean without predictability, without markers, without a shore. (p.25).

This gives some indication of the sensory experience and anxiety Charlie may have been feeling daily in a busy classroom environment. Therefore, it seems plausible to hypothesise that one factor impacting Charlie's outcome was his high level of unmet sensory need.

4.1.4 Section summary

This section sought to address whether the spontaneous communication of each student improved post intervention (RQ1) and to hypothesise within child factors that may have impacted progress (RQ3). In summary, we can infer that Adam's spontaneous communication improved notably, Billy's spontaneous communication improved for requesting, with some progress towards using symbolic methods to do this, and Charlie's spontaneous communication did not improve, according to staff. Autistic young people with SLD are a heterogenous 'group' (Georgiades et al., 2013; Male, 2015) with varying communication skills, personalities, strengths, interests and challenges. Within- child factors identified in the data that may have impacted progress include individual differences in:

- baseline communicative skills, particularly a capacity for shared attention;
- baseline communicative profile, recognising that for some children, outcomes must be more targeted than simply increasing all spontaneous communication;
- as well as the overwhelming impact of unmet sensory processing differences.

4.2 Implementation of strategies and staff level factors

This section addresses RQ2 - What are staff views regarding implementation of the agreed strategies? It also addresses staff level factors identified in answer to RQ3 - Which factors impacted the success of the intervention? In other words, this section presents data related to the implementation of strategies as well as staff level factors hypothesised to impact implementation.

Staff chose six communicative opportunities to implement as often as possible throughout the school day, alongside existing school practice based on Intensive Interaction (Nind & Hewett, 2001) principles. The communicative opportunities implemented in this Adult Interactive Style Intervention were:

1. Give a choice of activity, equipment, or food
2. Stop part way through an enjoyable activity
3. Give small portions of materials/ snacks
4. Make items visible yet inaccessible
5. Give materials the child will need help with
6. Contradict expectations

Findings from the check in questionnaire are presented first, giving an indication of how regularly staff (Anna, Ben, Charlotte) felt they implemented each communicative opportunity with their target student. Next, check in data is recapped alongside deductively analysed interview data and contextual information from my research diary to present staff views regarding implementation by communicative opportunity. Thirdly, critical realist thematic analysis (Fryer, 2022) identified three further staff level factors impacting the implementation of strategies and success of the intervention.

4.2.1 Implementation by adult/ student dyad

Anna used opportunity one regularly with Adam, (giving a choice of activity, equipment or food). She also used opportunities two - five daily but did not use opportunity six (contradicting expectations) at all. Ben used opportunity one and three regularly with Billy, (giving a choice of activity, equipment or food and giving small portions of materials and snacks). He reported using opportunities two and five daily but did not use opportunities four or six (making items visible yet inaccessible and contradicting expectations) at all. Charlotte was unable to use the communicative opportunities daily due to Charlie being on a part-time timetable.

Table 10: Self- report check-in data on usage of communicative opportunities

Communicative Opportunity	Not at all	1-3 daily	+3 daily
Give a choice of activity, equipment, or food			Anna Ben
Give small portions of materials/ snacks		Anna	Ben
Stop part way through an enjoyable activity		Anna Ben	
Give materials the child will need help with		Anna Ben	
Make items visible yet inaccessible	Ben	Anna	
Contradict expectations	Anna Ben		

4.2.2 Implementation by communicative opportunity

Anna and Ben reported the most regularly implemented strategy to be 'give a choice of activity, equipment or food', followed by 'give small portions of materials/ snacks'. This was followed by 'stop part way through an enjoyable activity' and 'give materials the child will need help with'. 'Make items visible yet inaccessible' was used less often and Anna and Ben both reported that 'contradict expectations' was not implemented at all. This is expanded upon below, drawing on my research diary and staff interview data, with communicative opportunities discussed in order, from the most frequently implemented to least frequently implemented.

4.2.2.1 Give a choice of activity, equipment, or food

Research shared during training sessions showed that adults should offer students a choice of activity, equipment or food without presuming their preferences (Bondy & Frost, 2011; Potter & Whitaker, 2001; Prizant et al., 2006). Video clips used to illustrate this point included Charlie responding verbally to being offered a choice between a blue and green crayon; Adam choosing between 'laptop' and 'outside' using picture cards; and Adam choosing 'water play' or 'swings' using gesture. Additional examples discussed during the project can be found in Appendix H.

The self- report questionnaire showed that Anna and Ben implemented this strategy more than three times daily. Although Charlotte was unable to implement strategies daily with Charlie, she commented: "*So the choice is fantastic. I think that should be used on everything, every day, every minute of your classroom. With learning, with choice time, anything that you're doing should be given a choice of different things. So, I think that should always be the way*". Anna shared that offering choices was easy to implement within Adam 's daily routine. Kossyvaki (2017) also found that offering choices was used frequently post- intervention and that this was considered one of the easiest principles to understand and implement.

This finding is supported by previous theory and research. Choice making is highly valued from a theoretical perspective, particularly since the recognition that independence should be defined through personal empowerment, rather than solely through the acquisition of self- help skills (Brown & Cohen, 1996). Self- determination is valued as an end in itself, and a fundamental right, but choice making also improves engagement and spontaneous communication (Potter & Whittaker, 2001). The act of making a choice requires communication with a level of spontaneity, and children with autism make substantially more spontaneous requests when they have access to preferred materials compared to non-preferred materials (Dyer, 1989). It is plausible to infer that staff feel choice making has value in itself, offering students empowerment and self-determination, as well as enhancing spontaneous communication.

4.2.2.2 Give small portions of materials/ snacks

Research shared during training sessions showed that giving a student a small portion of materials or snacks 'bit by bit' enables the student to practice their requesting skills (Bondy & Frost, 2011; Potter & Whitaker, 2001). Video clips used to illustrate this point included Charlie requesting more water using speech when given half a cup during sand play. Additional examples discussed during the project can be found in Appendix H.

The self- report questionnaire showed that Anna implemented this strategy one to three times daily and Ben implemented it more than three times daily, both finding it helpful. Anna commented "*Say he's in the foam or something that he likes, when he wants more, he will 'mu' or he will point to it….*", and stating that "*Give small portions of food, that's definitely worked for him*." Ben shared that "*We've been doing that now. And throughout the mornings, we will offer him one piece at a time. And then should he want more, we'll show Makaton for more and then what he might do is point towards the cupboard or point towards his bag. So, the places where he knows the food will be located. He has responded to this one*." However, Charlotte shared that this opportunity was tricky to implement with Charlie because *"he needs to have regularity"* so when given some play dough, *"his expectation is to have the whole pot because it's a pot and because it's closed*." The findings in the current study correspond with Kossyvaki's (2017) qualitative data which showed that all three adult participants reported giving small portions of materials/ snacks very effective with some children, but they also thought that it was problematic with others. In the same way that Charlie expected to have the whole pot of play dough, children in Kossyvaki's (2017) study wanted to have their whole biscuit and would not eat it if given a small piece. It is plausible to infer that staff consider this a highly motivating strategy. However, the difficulty autistic students have with flexible thinking can be a barrier, making it a helpful communicative opportunity to use with some students (e.g., Adam) but not with others (e.g., Charlie).

4.2.2.3 Stop part way through an enjoyable activity

Research shared during training sessions showed that stopping part way through an interaction or a student's favourite activity is an effective way to elicit their request to continue (Bondy & Frost, 2011; Potter & Whitaker, 2001), particularly when stopping the activity at its 'peak' (Kossyvaki, 2017). Video

clips used to illustrate this point included Adam using action to request 'more' when the spinner he enjoyed lying on was paused by an adult; and Charlie requesting 'more' through action when a sensory feather activity (stroking his arm) was briefly paused. Additional ideas discussed during the project included 'burst- pause' activities and further examples can be found in Appendix H.

The self- report questionnaire showed that Anna and Ben implemented this strategy one to three times daily. Anna reported being able to implement it *"with things like sensory materials, I can do that with him*," whereas Ben and Charlotte found it harder to implement with their students. Ben reported concern about potentially causing upset because *"stopping him half way through having a motivating item… may create a reaction from him that is not one that we want to necessarily experience*." Similarly, a participant in Kossyvaki's (2017, p.114) study shared that this opportunity might "*wind up*" the child. Another concern raised about this strategy was in relation to students with low levels of engagement. Charlotte found it hard to implement *"because of how little engagement he does have with enjoyable activities… It's hard to then try and stop it. There's so much that he gets out of something when he is engaging and likewise, learning with him or looking at him or just being with him doing that is a massive thing."* Similarly, a participant in Kossyvaki's (2017) study expressed concern that when stopping part-way through an engaging activity, the child "*just walks off*" (p.114). It is plausible to infer that staff feel engagement, connection and shared enjoyment is an essential foundation for interaction and communication with students who have low levels of engagement (Laevers, 2005) and that increasing the level of challenge is possible for students with higher levels of engagement, such as Adam.

4.2.2.4 Give materials the child will need help with

Research shared during training sessions showed that giving a student materials or access to activities that they need help with can elicit requests for assistance (Bondy & Frost, 2011; Potter & Whitaker, 2001). Video clips used to illustrate this point included Adam gesturing for help to complete a shape sorter activity during individual work. Ideas discussed during training included giving a snack with the wrapper or peal on. Additional examples discussed during the project can be found in Appendix H.

The self- report questionnaire showed that Anna and Ben implemented this strategy one to three times daily. Interview data suggests that this communicative opportunity was potentially helpful for all students but additional opportunities beyond those that occurred naturally were not engineered. Anna

shared that "*We do this a little bit… He will ask with help to put his shoes on and stuff…"* and although Charlotte could not implement the strategy daily, she reported occasional success with it, sharing that "*The slime, it's tricky for him to do and he really likes slime… So, he has been giving it to us to open… so I think he regulates himself and then asks for help or hands it to you, or he'll sign 'please' which is 'help', really."* Ben shared that he thought this opportunity had potential: *"Five, yes. I think the more I've got to know Billy, possibly five, certainly in terms of helping him and supporting him moving forwards, would be a strategy that we would look at doing more of as he gets a little bit older and as he gets a little bit more settled and aware of our expectations."* Qualitative data in Kossyvaki's (2017) study suggests that this communicative opportunity was viewed less positively by staff supporting young children. It is plausible to infer that staff feel this strategy has potential for secondary aged students but its implementation, outside naturally occurring opportunities, requires some additional planning and preparation.

4.2.2.5 Make items visible yet inaccessible

Research shared during training sessions showed that making items visible but out of reach so the student needs to ask for them (Bondy & Frost, 2011; Potter & Whitaker, 2001) can provide the opportunity for requesting. This communicative opportunity was not captured in any of the clips collected pre- intervention. Examples discussed during the project can be found in Appendix H.

Questionnaire data suggests that Anna implemented this strategy one to three times daily but Ben did not implement it at all. Anna found the strategy *"quite good in its own way",* describing how Adam requested inaccessible items such as his laptop, toast that has been covered, and sweets. However, both Ben and Charlotte expressed concern that this strategy would trigger upset. Kossyvaki (2017) also found that this strategy was not broadly used by staff participants as they reported concern that the children would "get extremely angry or lose interest" (p.114). It is plausible to infer that staff consider this strategy more feasible with students who are experiencing high emotional wellbeing (e.g. Adam). Additionally, staff feel that there is a balance to be struck in terms of optimal arousal and interest. The item needs to be one that is interesting enough but not of such high interest that it results in emotional overwhelm.

4.2.2.6 Contradict expectations

Research shared during training sessions showed that when adults contradict the student's expectations, perhaps by doing something unexpected and out of routine, it is likely that the student will request or comment (Potter and Whittaker, 2001; Griffin and Sandler, 2010). Chiang and Carter (2008) argue that strictly following students' daily routines may weaken spontaneous expressions, and Rämä et al. (2014) suggest that unusual teacher behaviour, such as not acting when expected to, compromises the prevailing structure, and may support pupils to communicate spontaneously. This communicative opportunity was not captured in any of the clips collected pre- intervention. Ideas discussed in training included putting a child's socks on their hands when helping them to get their shoes and socks on. Additional examples discussed during the project can be found in Appendix H.

The self- report questionnaire showed that Anna and Ben did not implement this strategy at all, or did not consider themselves to be implementing it. Both participants shared that they did not think it would work. Anna shared "*This, contradict expectations, I just don't think would work with Adam. I just don't think he'd understand that what I was doing, wasn't right. Do you know what I mean? I don't think he'd realise. He'd just look at me and then look away probably."* Ben agreed with this view, sharing *"I don't think he would fully be able to understand and process what's happening, so I'm not sure that would be effective."* Similarly, a participant in Kossyvaki's (2017) study shared that she had implemented this strategy with more able children previously but did not think it would work with pre- verbal children and might provide them with an unhelpful work model.

It is plausible to infer that staff lacked ideas for how to implement this strategy and did not recognise their own good practice in this regard. Although, it was not caught during pre- intervention filming, an effective opportunity for Adam (noted in my research diary) involved blowing up and then popping a balloon, with built-in anticipation including several occasions when the balloon did not pop as planned. This provided opportunities for Adam to comment.

4.2.2.7 Summary of staff views

RQ2 sought to find out staff views regarding implementation of the agreed strategies, including how often staff believe they implemented them and what staff thought and felt about each strategy.

Although staff report that the frequency, ease and impact of implementation varied by student, there was also some agreement in their preference for using particular communicative opportunities. For example, all three staff valued 'offering choices' and both Anna and Ben did not attempt 'contradict expectations.' The data also showed some alignment with staff views expressed in Kossyvaki's (2017) study.

4.2.3 Staff level factors

What staff thought and felt about the individual strategies was of interest in itself, but likely also impacted how often communicative opportunities were provided, forming one staff level factor impacting the intervention. Staff level factors can include professional characteristics, psychological characteristics, and attitudes towards the intervention (Domitrovich, 2008). Staff level factors have been shown to significantly affect the implementation of school-based interventions for children with autism in the US (Locke et al., 2016). Critical realist thematic analysis (Fryer, 2022) identified three other staff level factors impacting the intervention: staff self-efficacy, staff skills and confidence in finding the right level of challenge, and managing competing pedagogical priorities.

Figure 8: Staff level factors that impacted the intervention

4.2.3.1 Self- efficacy

The frequency of implementation across adult/ student dyads and across communicative opportunities may be related to staff self -efficacy. Bandura (1977) introduced the term self- efficacy and defined it as the belief that one can perform effectively in a given situation. In a teaching context, this refers to a staff member's beliefs about their ability to promote student learning to achieve an outcome. Data showed

that certain strategies were dismissed quickly by all staff as unlikely to work, such as contradicting expectations (4.2.2.6), so they were not tried. Strategies that could be captured and shown to be effective seemed to improve self-efficacy and implementation. For example, Charlotte shared that "*when you showed the videos and what we didn't realise we were doing was actually effective, I think that's what helped me."*

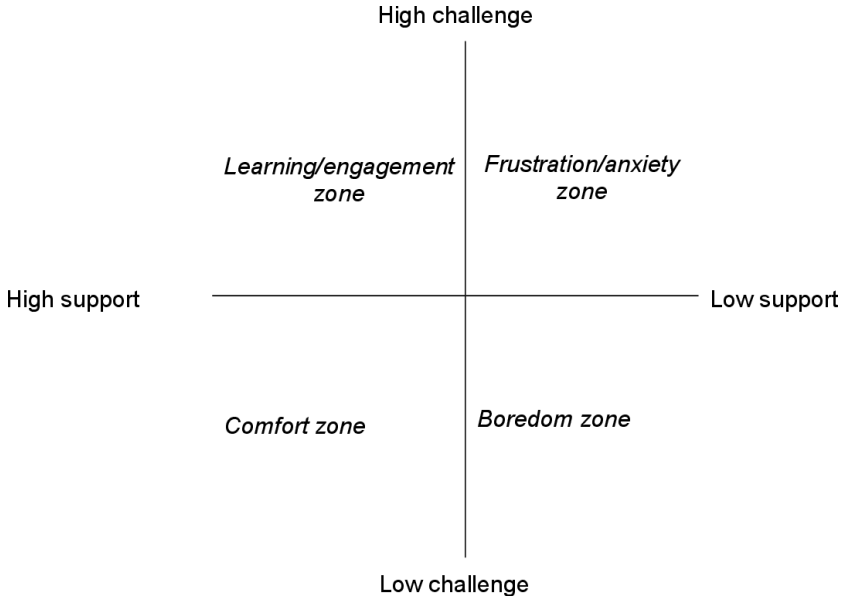
There is little previous research specifically in this area although studies make the link between staff self-efficacy and inclusionary practices (Wray et al., 2022), staff self- efficacy and the use or abandonment of AAC systems for students (Parks, 2021) as well as the impact of perceived communicative competence on the abandonment of AAC systems (Radici et al., 2020). The research available suggests that mastery experience, the experience of success or failure in a specific situation, is a powerful source of self-efficacy (Yada et al., 2019). Higgins and Gulliford (2014, p.123) note the importance of "efficacy expectancy," or the confidence that by exerting one's influence, a desired outcome will be reached. Given the nature of social communication difficulties in autism, many communicative opportunities offered by staff are likely to end in failure, reducing staff confidence that by exerting their influence, the desired outcome will be reached. Therefore, the degree to which strategies were implemented may be related to the efficacy expectancy of staff.

4.2.3.2 Confidence in finding the right level of challenge

The frequency of implementation across adult/ student dyads and across communicative opportunities may be related to staff confidence in being able to find the right level of challenge. Data showed that all staff participants in this study expressed some concern about the impact a strategy may have on the emotional regulation or engagement of a student. For example, Ben and Charlotte expressed concern that making items visible yet inaccessible would impact emotional regulation, Ben expressed concern that stopping part way through an activity *"may create a reaction"* and Charlotte was concerned this would impact engagement. My research diary indicates that careful task analysis was required to strike the right balance for some students, e.g. briefly stopping part way during a sensory activity may elicit an action or gesture communicating 'more', but stopping part way through a child's favourite You Tube clip may elicit distressed behaviour communicating protest. When using a communicative opportunity, finding the right level of challenge was easier with some students than others. For some students, there

was a very fine line between the learning zone and the frustration zone depicted on Mariani's (1997) model.

Figure 9: High challenge/ high support model (Mariani, 1997)



This finding has also been reported in the literature on Naturalistic Behavioural Developmental Interventions in the US, where both developmental and behaviourist strategies are employed. A preference for using the developmental strategies has been reported by clinicians (Lee, 2023), educators (Maye et al., 2020) and families (Cycyk & Huerta, 2020) as behavioural strategies can contribute to child frustration. Lee (2023) makes the point that this does not mean behavioural strategies are not effective, but that developmental strategies are easier to implement. Kossyvaki (2017) argues that an overarching rule practitioners should bear in mind is that the strategies need to be applied in a creative way. The challenge with implementing communicative opportunities is adapting them to suit the target child. Staff need to move beyond fluency and generalisation to adaptation (Haring & Eaton, 1978) in order to skilfully provide communicative opportunities within the context of everyday school life, for children who have complex and unique needs. Finding the right level of challenge is undoubtedly very difficult, and much more so with some students than others. However, Temple Grandin (2009, p.101), an autistic individual, writes that in her experience, although "too much intrusion would cause tantrums… without intervention there was no progress."

4.2.3.3 Competing pedagogical priorities

Two participants in the study prioritised receptive language development and compliance when asked specifically about the expressive language development of the students post-intervention. Charlotte shared that Charlie *"is now responding to me asking him to do things like pick something up or, come on, sit back down on your chair. Normally you would have to go and guide him…".* Ben particularly valued routine and shared that *"Billy 's started to grasp the concept that he's not in control and it doesn't just belong to him all the time. So yes, I think we are making really good progress and most of the basics that we could possibly want in terms of routine are slowly falling into place."* Additionally, Ben shared that *"he is beginning to manage himself more effectively without that constant demand of me, me, me, this is what I need now, that we had several months ago."* It is plausible to infer that receptive language development and following instructions and routine held greater importance for staff than expressive language development, resulting in competing pedagogical priorities during this intervention.

The focus staff had on receptive language and following routine may be related to broader factors that influence school policy, such how schools are evaluated nationally using the Education Inspection Framework (Ofsted, 2022b). Inspectors make key judgements in four areas, one of which is behaviour and attitudes, evaluating whether a school has high expectations for learners' behaviour and whether this is reflected in the students' conduct (Ofsted, 2022b). Behaviour management, including establishing clear rules and routines is also a key feature of the Teacher's Standards (DfE, 2021). The positive behaviour policy of the school in which this research took place sought to meet these requirements whilst meeting the needs of their students, consequently placing significant focus on the importance of routine. Routine is very important for students with autism, but this is not quite the same thing as 'following' routine or instructions.

Furthermore, although spontaneous expressive communication has been identified as the most important goal in educating autistic students (National Research Council, 2001; Prizant & Wetherby, 2005), this goal is not reflected in guidance, potentially impacting staff values and pedagogical priorities. Although the engagement model (DfE, 2020) draws attention to principles (responsiveness, curiosity, discovery, anticipation, persistence, initiation, investigation) that could effectively be applied to communication, it specifically stipulates in 'Recommendation 3' that the purpose of the model is for statutory assessment of students' learning and cognition, rather than being applicable to all four areas

of need outlined in the SEND Code of Practice (DfE & DoH, 2015). To this end, the definition of initiation provided is "the different ways and extent to which a pupil investigates an activity or stimulus in order to bring about a desired outcome" (Rochford, 2016, p.18), which is not consistent with the concept of initiation for spontaneous expressive communication. The justification for this is that because statutory assessment for mainstream pupils is based on cognition and learning, statutory assessment for pupils with severe or profound and multiple learning difficulties should also be focused on the area of cognition and learning (Rochford, 2016). This illustrates a concern raised in the literature review (2.1.2), that extending national policies, processes and expectations to students with SLD and PMLD without adapting these or providing a specialist focus, is a values- driven approach (Kauffman et al., 2021) that does not adequately meet the students' needs.

Competing pedagogical priorities may also be related to staff coping with or managing behaviours that challenge. Anna made fewer references to competing pedagogical priorities and focused her comments on expressive language development, suggesting that staff feel more able to focus on this when students exhibit higher compliance, such as Adam. Finding ways to prioritise and enable spontaneous expressive language development for all students is an important right in itself, but research also suggests this will have a positive impact on behaviours that challenge. The literature strongly suggests an inverse association between expressive language ability and externalising behaviour in autistic students (Chan et al., 2022) - as one increases the other decreases.

Regardless of why adult participants valued receptive language development and following instructions over expressive language, this likely impacted the intervention. Research suggests that the theoretical orientation or values of educators can impact intervention delivery (Dingfelder & Mandell, 2011) as the implementation quality of an intervention to foster a specific skill is related to the perceived value that skill holds for those responsible for implementation (Domitrovich et al., 2008). Therefore, the degree to which staff implemented the agreed communicative opportunities may be related to the value they assigned to expressive language development and facilitating child voice, or what they perceived their role to be in this regard.

4.2.4 Section summary

This section sought to report staff views regarding how often strategies were implemented across adult/ student dyads, what staff thought and felt about implementing each strategy (RQ2) as well as hypothesising staff level factors that may have impacted implementation (RQ3). In summary, providing choices was used regularly and considered effective by all staff participants. The other communicative opportunities were felt to be helpful for some children but not for others. Staff level factors identified in the data that may have impacted implementation of the strategies include:

- staff self-efficacy,
- staff confidence in finding the right level of challenge, particularly for children who become dysregulated or disengaged easily,
- and competing pedagogical priorities.

4.3 Process and school level factors

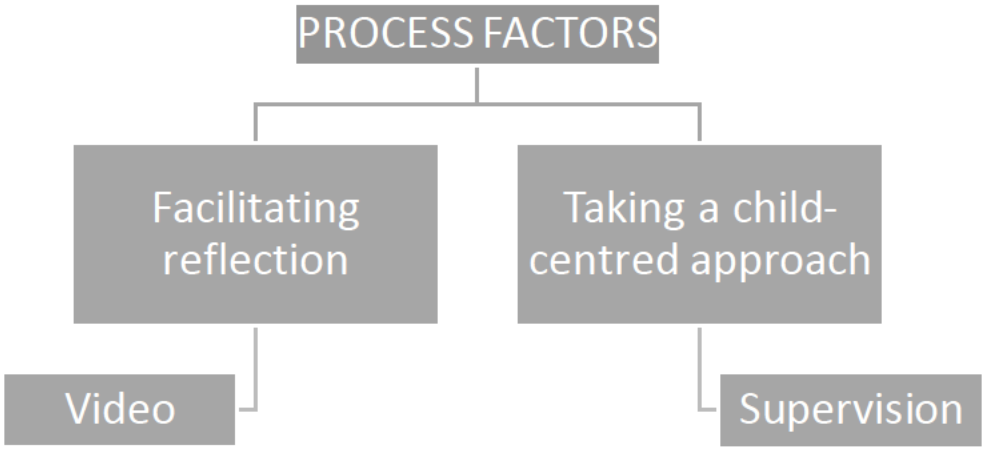
This section addresses RQ3 - Which factors impacted the success of the intervention?
Critical realist thematic analysis (Fryer, 2022) of staff interviews to identify factors that impacted the success of the intervention produced student and staff level factors that have already been discussed. Analysis also identified process factors and school level factors that may have impacted this Adult Interactive Style Intervention. Process factors and school level factors identified by staff are addressed in this section.

4.3.1 Process factors

Domitrovich et al. (2008) make a distinction between the intervention strategies and the support system for delivering the intervention strategies. Using this distinction, the first element was addressed in the previous section and the second element will be addressed in this section. The support system is the means through which the intervention strategies are actioned and usually includes elements related to training (Domitrovich et al., 2008). Critical realists would consider the support system to consist of process factors. Process factors within the intervention move beyond *what* was implemented to *how* it was implemented, in line with critical realist evaluation (Pawson & Tilley, 1997). Process factors

highlighted in this study are facilitating reflection, and taking a child- centred approach, with the use of video and staff supervision as subthemes.

Figure 10: Process factors that impacted the intervention



4.3.1.1 Facilitating reflection

Facilitating reflection was identified by all staff as a key process factor that impacted the intervention. Staff shared multiple comments referring to how the intervention encouraged reflection on practice. Anna shared *"It's just, I suppose, you're a little more mindful in the back of your head, oh, this relates to this, kind of thing."* Charlotte shared *"There's a few things that you've taught me that I didn't know that I was doing."* Ben discussed the benefits of having time to *"just stop and reflect,"* adding that it has made staff "*more consciously aware*." Reflection in action forms a significant part of the intervention. Staff have a go at trialling strategies and are facilitated to reflect on what went well. The value of reflection on teacher practice has been recognised for some time (Walshe & Driver, 2019), with foundations in the work of Dewey (1933, p.79) who said that "we do not learn from experience… we learn from reflecting on experience." Therefore, the quality of the intervention may be dependent upon the degree to which staff were facilitated to engage with the reflective process.

Video is considered a useful tool to support reflection (Tripp & Rich, 2012). It can be challenging to confront and evaluate your own practice (Körkkö et al., 2016) and video can provide a scaffold to

support this. Importantly, a strengths- based approach (Seligman, 2009) is taken in this intervention. Clips are edited to illustrate good practice, which is likely to build self-efficacy (Bandura, 1977), as discussed in the previous section. The importance of video for facilitating reflection was highlighted by Anna, who shared *"It's been quite insightful to see (the video footage) because I suppose we do a lot of them anyway (strategies) but we didn't really notice that we were doing it. It is adjusting our thinking to facilitating their communication."* Charlotte agreed, sharing *"I think we're doing most of it anyway. I think we are. But when you explain things in the video, I was like, well yes!"* Therefore, the success of the intervention may be dependent upon facilitating reflection through the use of video.

These findings are in line with previous studies focusing on adult interactive style in schools and educational psychology work in special schools. For example, McAteer and Wilkinson (2009) found that using video feedback in a one-to-one context with staff enabled them to engage in self-reflection and develop their interactive style. McAteer and Wilkinson (2009, p.1) focused on highlighting the adults' strengths, with the intention that adults "leave the room feeling better about themselves". Kossyvaki (2017) focuses her analysis on intervention principles rather than intervention process. Although she did not collect data on staff views regarding the intervention process, the subsequent reflections in her book highlight the value of video reflection. EPs in Winter and Bunn's (2019) survey reported the use of VIG and VERP, coaching and reflective groups in the training they offer. VERP was fundamental in Hampton et al.'s (2019) study as it improved professional confidence and led to subtle changes in practice. Crombie et al. (2014) also found a strengths- based, reflective approach to be the key to professional development, making unnoticed and unconscious good practice explicit.

However, it should be noted that reflection is not considered of particular value in studies specifically focusing on training staff to implement communicative opportunities. These studies (Andzik & Cannella-Malone, 2019; Wermer et al., 2017) strongly advocate for a more directive approach. They used behavioural skills training (BST) incorporating modelling, rehearsal, performance feedback, and written directions for implementation. Student outcomes were positive, as were staff views regarding BST. The researchers' decision to use BST centred on two systematic reviews of the literature identifying evidence-based approaches to educator training (Brock et al., 2017a; Brock et al., 2017b). However, the criteria for inclusion were narrow, specifying an experimental approach, which may have excluded many studies using reflection as a key mechanism for behavioural change. Nonetheless, my research diary

indicates that staff may have benefitted from further modelling. Perhaps these approaches do not need to be mutually exclusive.

4.3.1.2 Taking a child-centred approach

All staff participants in this study felt that their students had highly individual needs that required a bespoke approach in terms of support. For example, Charlotte shared that with Charlie, you need to *"find out what kind of day it is, what kind of mood he's in, how he's slept at night, his hay fever and allergies, whether his eyes are red."* Ben added, "*I think we're making decisions on a daily basis to support a particular child."* Staff allude to the need for a child-centred approach, where the unique personalities, strengths, stressors, and motivators of a child are placed at the centre of decision making and action. The student's strengths, difficulties and unique learning profile should determine the intervention strategies used to improve spontaneous communication in individuals with autism (Duffy & Healy, 2011).

The importance of individual differences in terms of communicative ability, communicative profile and sensory profile were highlighted in the first section (4.1) outlining student outcomes and within student factors impacting outcomes. The importance of staff confidence in the bespoke application of strategies to achieve high challenge/ high support for individual students was highlighted in the second section (4.2) presenting data related to the implementation of strategies and staff level factors hypothesised to impact implementation. Critical realist thematic analysis (Fryer, 2022) also showed that the degree to which a child-centred approach was facilitated as part of the support system for the intervention mattered to staff, and likely impacted the success of the intervention.

As noted in my research diary, the importance of taking a child-centred approach became clear quite quickly during this intervention study, so the focus shifted from a group approach to working with adult-student dyads. As Ben commented, *"I think doing it as a group, it's quite difficult because some staff won't know the children as well."* A supervision session (Hawkins & Shohet, 2012) was held individually for each member of staff. Charlotte, who was finding it hard to implement anything new with Charlie drew on the supportive function of supervision, whereas Anna and Ben discussed targets and strategies for their students. Ben shared, *"I think the most productive part of the project was probably the individual interviews (supervision sessions) because you're talking specifically to a member of staff that*

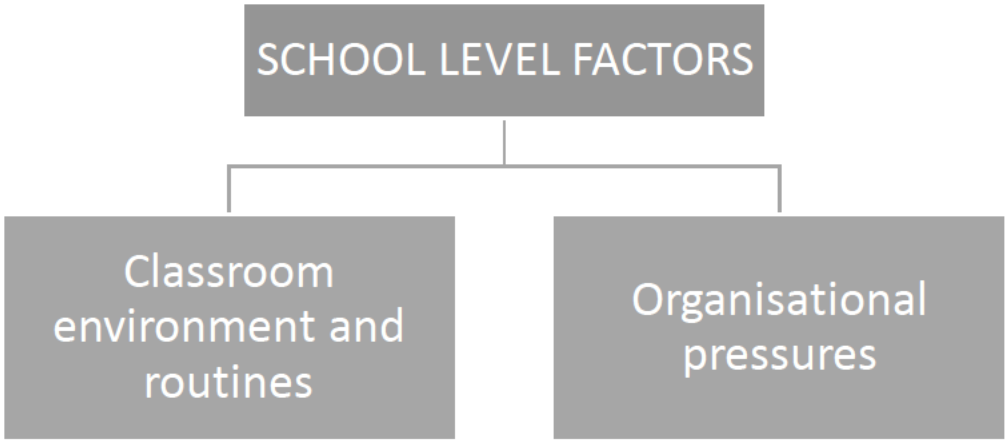
then works with a particular child. I think you're probably going to get more rich communication between yourself and whichever member of staff, that is specifically about that child." Furthermore, it is noted in my research diary that individual supervision sessions allowed me to develop a greater understanding of the staff as individuals too, and discuss intervention strategies that they felt comfortable implementing. Staff are not a homogenous group either (Parsons et al., 2009) and it is important to understand the ecologically determined 'initial conditions' of each member of staff in order to provide effective professional development (Keay et al, 2019). For example, some adults feel much more comfortable being 'silly' and contradicting expectations, than others.

Although adult-student dyads formed units within the broader case study, the training sessions were conducted as a group. Video footage illustrated the way a communicative opportunity might be applied with different students whenever possible and individual students were discussed within the group context, but a child-centred approach was not adopted throughout this intervention. In other studies where staff are trained to use communicative opportunities (Andzik & Cannella-Malone, 2019; Wermer et al., 2017), training took place within adult-student dyads, facilitating a child-centred approach that starts by identifying child- centred motivators. The impact of the intervention may be dependent upon the degree to which a child- centred approach was adopted.

4.3.2 School level factors

The organisational context of schools has a significant impact on the delivery of interventions because students, staff and management are embedded in this shared environment (Ringeisen et al., 2003). School level factors have been shown to significantly affect the implementation quality of school-based interventions for children with autism in the US (Locke et al., 2016). Domitrovich et al. (2008) define school level factors as factors that relate to the schools organisational functioning, such as the structure, the resources, staff perceptions of their workplace, and characteristics of the school and classroom that have been found to be pertinent. School level factors highlighted in this study are classroom environment and routines, and organisational pressures.

Figure 11: School level factors that impacted the intervention



4.3.2.1 Classroom environment and routines

Two participants in the study (Anna and Charlotte), both higher level teaching assistants, felt that classroom norms and expectations facilitated or hindered the implementation of certain communicative opportunities. Anna found that following Adam's transition to a new class, most opportunities were easier to engineer within the context of his new class routine, sharing *"I suppose as an example, he doesn't have his lunchbox out all the time now that he's in Cedar class, so if he wants more food then he has to request it, and he will request it, whether it's gestures or 'mu', that's a sign for please."* Additionally, Charlotte felt that some communicative opportunities should be implemented from the beginning, across a classroom environment, to be feasible: *"I think... starting with new Year 7s and having that on your plan (make items visible yet inaccessible) ... I believe it could work but again, it has to be from the beginning, in a new environment."*

Research indicates that interventions yield most successful outcomes when integrated into daily practice and classroom culture (Goldberg et al., 2018). Therefore, the impact of the intervention may be dependent upon taking a whole class approach to enabling certain communicative opportunities, whilst recognising the complex individual strengths and needs of each student.

4.3.2.2 Organisational pressures

All three staff indicated that their job could be stressful. Several members of staff were unwell for an extended period of time, leading to increased staffing pressures and a juggling of roles and responsibilities. Ben shared that "*I just think that through no fault of anybody, it's just been a very difficult time over the last six or seven weeks… And that mainly comes to down to staffing unfortunately and absences, which has slowed down, if you like, the fluid nature that I think would be needed to fully put into practice what we've been discussing."* However, Anna commented that "*it's not been any extra pressure*" because the strategies are integrated into daily practice, suggesting that the naturalistic and non-prescriptive nature of the intervention makes it manageable within the context of significant organisational pressures.

Research suggests that staff working with autistic students can find themselves feeling deskilled, over-responsible, isolated, and overwhelmed (Pittman, 2007). School staff burnout, particularly for staff working with students who have special educational needs and disabilities, is reported in the literature (Brittle, 2020). This will have been exacerbated by the pandemic, during which special schools remained open throughout national lockdowns, safeguarding the educational rights of students but negatively impacting the wellbeing of staff (Crane et al., 2021; Skipp et al., 2021). Therefore, the success of the intervention may be dependent upon organisational pressures, possibly related to staff burnout.

4.3.3 Section summary

This section sought to report process factors and school level factors hypothesised to impact the success of the intervention.

Process factors identified in the data that may have impacted the intervention include:

- facilitating reflection, and
- taking a child-centred approach.

School level factors identified in the data that may have impacted the intervention include:

- classroom environment and routines, and

- organisational pressures.

The classroom environment and classroom routine may have supported or prevented staff from engineering opportunities for communication, raising the importance of a coordinated and planned approach. Organisational pressures, potentially due to staff burn out, created a challenging context in which to affect change but the naturalistic nature of the intervention enabled a flexible approach that worked within the constraints of school and staff capacity.

Reflection, supported by strengths-based video analysis, may have positively impacted the intervention by building self- efficacy in staff. However, including further instructional strategies, such as modelling, could be helpful alongside this. Taking a child-centred approach, actioned through individual supervision sessions with staff, was suggested to positively impact the intervention by providing the opportunity to co-create communicative opportunities led by specific child motivators and adult acceptability. However, working with adult/ student dyads more closely throughout the intervention may have been helpful. When compared to Kossyvaki's (2017) work and 'the concept' (3.7.1) being replicated in this study, the importance of reflection as a process factor is not unexpected, but the importance of taking a child- centred approach has implications for future action research cycles and may be more relevant for secondary aged students.

It is also interesting to consider what was not highlighted in the data but formed a key part of 'the concept' being replicated (3.7.1), namely, collaboration. Collaboration between staff and researcher was a key element of the intervention, and a key aspect of the research methodology. Kossyvaki (2017) highlights the empowering nature of collaboration in an Adult Interactive Style Intervention, Pellicano (2018) highlights the importance of collaboration with school staff in autism research more generally, and collaboration is aligned with educational psychology values and practice (BPS, 2019). However, it did not form a theme in analysis as only one member of staff (Ben) made reference to this. This may be related to staff burn out and organisational pressures, or perhaps a more directive approach would be preferrable for some staff.

4.4. How is the spontaneous communication of three young people with autism and SLD impacted by an Adult Interactive Style Intervention?

This aim of this study was to find out how the spontaneous communication of three young people with autism and SLD is impacted by an Adult Interactive Style Intervention. The students formed nested cases within the broader case study of the intervention. Conclusions related to the broader case are presented first and then illustrated by student.

4.4.1 The Intervention System

Data pertaining to RQ3 highlighted tentative causal hypotheses, or factors, that impacted student outcomes within this Adult Interactive Style Intervention.

Table 11: Summary of factors impacting this Adult Interactive Style Intervention

Student factors	Individual differences, specifically in terms of: • baseline communicative ability • baseline communicative profile • sensory differences
Staff factors	• self-efficacy • staff confidence in finding the right level of challenge • competing pedagogical priorities
Process factors	• facilitating reflection • taking a child-centred approach
School level factors	• classroom environment and routines • organisational pressures

Critical realist intervention research often concludes with context-mechanism-outcome (CMO) configurations, developed for realist evaluation (Pawson & Tilley, 1997). However, these have been critiqued by De Souza (2022) as a practice focused on fairly closed systems. To aptly capture how the relational interactions between programs and social systems within which they are embedded impact outcomes, De Souza (2022) makes a conceptual connection between critical realism and systems

thinking, showing that systems approaches to evaluation can allow for a plurality of causal explanations, capture the impact of broader cultural factors, and allow for explanations from the standpoint of social actors. Therefore, systems thinking (Bronfenbrenner, 1994), and its application in intervention evaluation literature (Domitrovitch et al., 2008), informed the model below. School, process and staff level factors, within the broader cultural context, are hypothesised to influence the provision of communicative opportunities and student outcomes. Individual differences between students are also hypothesised to impact the provision of communicative opportunities and student outcomes. The factors depicted are not exhaustive and many other factors that were not evident in the data will also be relevant. Furthermore, data suggests that some factors had greater influence in certain adult/ student dyads. To understand how the spontaneous communication of each student is impacted by this Adult Interactive Style Intervention, we can move through the model, starting from the centre, to summarise the experience of each pair.

Figure 12: Model of the intervention system

4.4.1.1 Adam and Anna

Adam was the most able communicator at the start of the intervention, with the best shared attention skills. He was calm, not experiencing heightened anxiety at the time and seemed settled in school. Triangulated data showed progress in Adam's spontaneous communication post intervention. The quantity of spontaneous communication he engaged in increased, the functions he communicated for broadened, and he began to use more speech. Anna found the communicative opportunities helpful, commenting "*I think they do work*" and reporting positively on the implementation of five out of the six strategies. Anna did not report concern that strategies would trigger upset, suggesting she felt able to find the right level of challenge for Adam. Anna found video reflection helpful, sharing that it drew her attention to the strategies she was already using, building her self- efficacy, and it adjusted her thinking to facilitate Adam's communication. Anna reported that the classroom environment and routines supported her to provide communicative opportunities. Anna was able to focus on Adam's expressive communication, she did not indicate feeling influenced by competing pedagogical priorities and did not work in the classroom that was most heavily impacted by organisational pressures.

4.4.1.2 Billy and Ben

Billy was a cheerful boy throughout the intervention who enjoyed interaction with adults. He engaged in a lot of spontaneous communication through action (tapping shoulders and making eye contact). The function was usually dyadic in nature – requesting social routine or drawing attention to himself/ seeking connection. The function could also be to refuse adult directed activities. Led by Billy's communicative profile and staff priorities, communicative opportunities were used to expand Billy's functions and methods to requesting using symbols. Triangulated data showed increased requesting with small steps of progress towards using symbolic methods. Ben reported finding some of the communicative opportunities helpful, particularly offering choices and giving small portions of materials/ snacks, which were related to his desired outcomes for Billy. Ben found taking a child-centred approach to be very important and highlighted the individual supervision sessions as helpful. These were used to think about how each communicative opportunity could enable greater spontaneous requesting, as well as how each communicative opportunity could be used to scaffold and teach the use of key picture cards. Ben had a strong focus on receptive language and following routine. Ben was the

only teacher of the three adult participants, and data suggests he was influenced to a greater degree by competing pedagogical priorities, developed in the context of broader factors listed around the outside of the model. Ben also had the greatest responsibility for juggling various organisational pressures.

4.4.1.3 Charlie and Charlotte

Charlie showed the potential to make his needs and wants known. Charlie experienced significant sensory needs and the classroom environment was not conducive to learning for him at the time. His wellbeing and engagement were very low. Charlotte's first priority was ensuring Charlie's safety and wellbeing. She was unable to regularly use any of the communicative opportunities during the intervention period. Although she valued providing choices, this caused Charlie to become very dysregulated too. Nonetheless, Charlotte reported reflection to be helpful as it improved or reinforced her sense of self- efficacy.

4.4.2 Section summary

In summary, critical realist thematic analysis identified a number of student, staff, process and school level factors that determined how this Adult Interactive Style Intervention impacted the spontaneous communication of three young people with autism and SLD. The prominence and combination of interacting factors is hypothesised to impact the implementation of communicative opportunities and outcomes for each nested case, or individual student, within the broader intervention study.

CHAPTER 5: CONCLUSION

Although this project is only one "authenticated anecdote" (Simons, 2009, p.4), the findings offer an indication that an Adult Interactive Style Intervention is potentially an effective piece of work for EPs to deliver in a secondary special school setting. Implications for EP practice are discussed in this chapter, following limitations of the research findings and future research directions.

5.1 Limitations of the findings

Critique of action research case study methodology was acknowledged in section 3.2.4. Further to this, and within the context of what action research case study methodology can and cannot offer to collective knowledge, additional limitations of the findings are outlined below.

- The procedure in this study sought to apply the original 'concept' being replicated, a key part of which was collaboration and school-led decision making. Due to school preferences, this study only focused on communicative opportunities rather than fully exploring the communicative principles in the original AISI study (Kossyvaki, 2017). Staff felt that Intensive Interaction formed the core of their practice already and many of the general communicative principles stemmed from this approach. Therefore, during the intervention stage, staff chose to only focus on the application of communicative opportunities. This could be argued to limit the scope of the intervention as it was originally conceived.

- In line with action research principles, the study aimed to achieve a democratic partnership (Hall, 2001) between researcher and school staff as equal contributors (Parsons et al., 2013). Top down or 'evidence - based practice' gathered from the literature (Kossyvaki, 2017) and bottom up or 'practice - based evidence' gathered from school staff was to form the foundation of agreed actions. However, the collaborative and emancipatory orientation of action research (Cohen et al., 2018) was not fully realised as staff 'buy in' varied. The Autism Lead who was due to participate, and with whom I had established a strong collaborative working relationship, became unwell just before pre- intervention filming began. Ben took over her class, in which Billy and Charlie were students at the start of the intervention. All staff involved took a professional approach to the project but the interest in focusing on the students' spontaneous

communication and the impetus to participate came from school managers, who were not themselves involved. Therefore, staff values in relation to enabling communication varied, as did their motivation to contribute to discussion and to implement the strategies.

- Alongside the instability caused by staffing challenges and students transitioning to new classes, as described in section 4.3.2.3, two heat waves and the tail end of the pandemic created difficulties that impacted the delivery of the intervention beyond organisational factors that might typically be present in a school setting. In particular, time restrictions limited the scope of training and supervision sessions.

- This study suggests the students' spontaneous communication pre and post intervention, the reliability and validity of which improved when triangulated with qualitative data from staff interviews. However, achieving representative data according to SCERTS guidance (Prizant et al., 2006) whilst respecting participant time and classroom commitments (BERA, 2018) was not possible in the current study, impacting the reliability of the observation data. Furthermore, even if SCERTS observation criteria (Prizant et al., 2006) had been met, the impact of numerous potentially causal environmental factors in the current study cannot be discounted, e.g. change of classroom or environment. Additionally, although codes were mutually exclusive, comprehensive, complete and relevant (Denscombe, 2017), partial interval sampling required decisions to be made whereby occasionally only the dominant communicative act was coded, thereby not reflecting *all* communicative acts. Furthermore, assigning codes to reflect the communication of autistic students with SLD requires interpretation. Liaison with the Autism Lead, who knew the students well, and the inter-rater reliability check improved the validity of findings. However, interpreting complex communicative behaviours is challenging, impacting the confidence that can be had in the observation data.

- Only self-report data was collected on staff implementation of the agreed communicative opportunities. Being a naturalistic intervention and integrated into daily practice made it challenging to assess the extent to which adults were able to change their interactive style. Coding the number of times staff used each communicative opportunity in video data was considered but dismissed because it may have felt threatening for staff. Additionally, with a focus on bridging the research to practice gap, reactivity (Lee et al., 2017), which refers to those

being observed changing their behaviour when filmed, seemed a likely threat to the ecological validity of the findings and their relevance for EP practice. However, the fundamental goal of the intervention is to promote behaviour change in adults, which is hypothesised to impact student outcomes. Therefore, this impacts the confidence that can be had in the findings.

- A critical realist approach to intervention evaluation requires engagement with causal hypotheses. This is important in order to investigate how an intervention works and to be able to make improvements to it. However, the subjective epistemology of critical realism should be reiterated. The factors identified were evident in the data, as I interpreted it. Although care was taken to ensure validity and transparency, my interpretation is subjectively mediated, culturally situated and imperfect (Smith, 2006).

5.2 Implications for future research

Data gathered during this action research cycle highlighted adaptations to be considered in future cycles, as detailed in Table 12.

Table 12: Points to consider for future action research cycles

Learning point from data gathered	Adaptation to consider in future research cycles
The individual differences of students impact outcomes, with sensory needs and wellbeing presenting a significant barrier to progress.	The researcher could be more involved in choosing student participants and ensuring that wellbeing and sensory needs are being addressed prior to participation.
Classroom environment and routines support the implementation of communicative opportunities.	If the intervention is undertaken as a group, the researcher should work with students and staff in one class only.
It is difficult for staff to find the right level of challenge when implementing communicative opportunities.	The practical implementation of strategies should form a key focus of the intervention. Behavioural Skills Training approaches could be explored further.
Facilitating reflection through video was key to learning and building staff self - efficacy.	Researcher facilitated VERP sessions to follow on from the initial intervention may embed practice.

Learning point from data gathered	Adaptation to consider in future research cycles
Competing pedagogical priorities play a role in the value staff assign to enabling expressive communication.	Training sessions could include time for staff to explore their understanding of spontaneous communication- what does it mean for education, the curriculum and the students' lives? Staff could be more involved in the 'assessment' or initial coding of students' spontaneous communication to give them greater insight and understanding of the individual.
Taking a student centred or dyad centred approach was important. Students have unique abilities, interests, and motivators, as do staff.	The researcher could take a dyad-centred approach throughout the intervention.
Organisational pressures, particularly in a special school context, can be significant.	Staff time (and potential cost) is a key factor, and essential to consider should researchers hope to develop an intervention that is feasible and therefore likely to have real world impact.

5.3 Implications for educational psychology practice

The literature and findings discussed in this thesis have implications for the profession of educational psychology, specifically in relation to this intervention, and more generally in terms of EP practice in special school settings.

5.3.1 A revised idea

Table 12 summarises learning points from this project and adaptations to consider in future action research cycles. These are relevant for formal empirical research but also hold relevance for the daily practice of EPs. Educational psychologists are "scientist- practitioners," suggesting a dual role between research and its application in the real world (Sedgwick, 2019, p.1). The 'revised idea' (Thomas, 2017) presented in Table 13 is based on learning points from Table 12 as well as my own reflections regarding what might be feasible within the context of educational psychology practice. Table 13 presents *one* 'revised idea' for EPs to consider.

The approach is designed to be consultative, cost- effective and flexible. It could be undertaken with a SENCO or teacher, who could then upskill new staff. It may be particularly helpful in upskilling staff recruited to new resource bases in the Local Authority I work in.

EPs may first wish to develop their understanding of spontaneous communication and the AISI strategies by trialing them during casework. The observation schedule (Appendix I) and guidance on methods and functions (Appendix J), could be used to assess a student's communicative strengths during observation. Equally, the AISI strategies (Appendix A) could be used in observation to highlight staff practice or mediation that works well, or to inform EP recommendations.

Table 13: One 'revised idea' - guidance for EPs

Step	Guidance	Appendices
Step 1 Gain buy in from the school	• It might be helpful to share that spontaneous communication has been identified as the most important goal in educating autistic students (National Research Council, 2001; Prizant & Wetherby, 2005) and that the principles of an Adult Interactive Style Intervention have been highlighted as fundamental pedagogy for students with SLD/PMLD by experienced special school headteachers/ advisors (Imray & Hinchcliffe, 2014).	
Step 2 Identify staff/ students	• Identify an adult/ student dyad that might benefit from an Adult Interactive Style Intervention or a group of adult/ student dyads that all work within the same classroom.	
Step 3 Film natural interaction	• Film during an activity the student enjoys for 10 minutes or so. • Capture good moments/ short clips if this works better. • The Leuven Scale could be used to identify an activity the student enjoys. (see Appendix D)	Appendix D
Step 4 Analyse film together, *with* the member of staff	• Ask facilitative questions about the student's strengths & motivators: e.g., "When is she at her most communicative? What motivates her to communicate?" • Ask facilitative questions about the students' spontaneous communication: e.g., "What does that communicative behaviour mean? What is the function/ purpose of that communicative act? Does she use other methods to convey that message? Does she use that method to convey other messages?"	Appendix I Appendix J Appendix A Appendix H

Step	Guidance	Appendices
	• Code some of the student's spontaneous communication together to inform your discussion. (see Appendix I & Appendix J) • Refer to AISI strategies together to highlight all good practice noticed. e.g., "These are strategies from the research and I can see you're already using A, B and C... When you did X, I noticed that Y." (see Appendix A & Appendix H)	
Step 5 Decide on a target for the student together	• This can be based on what the student is doing well already and you want to see more of, or what the student does not yet show in their spontaneous communication profile. • This can be a 'Specific Measurable Attainable Realistic Time-bound' (SMART) target or a 'Student-led, Creative, Relevant, Unspecified and Fun for Youngsters' (SCRUFFY, Lacey, 2010) target. e.g., SMART = By half term, Billy will request 'snack' using a symbol on three consecutive days. e.g., SCRUFFY = Adam will express enjoyment and comment during sensology activities.	
Step 6 Decide on helpful strategies for the student together	• Refer back to AISI strategies to consider which may be helpful to focus on and specific ways in which to use them, based on student motivators and what has been observed to work well in the film footage. e.g., "Which ones do you think look helpful? How would that look in practice? How would that support progress towards the target we have set?" (see Appendix A & Appendix H)	Appendix A Appendix H
Step 7 Check in and review	• Review progress with member of staff • Repeat filming if deemed helpful • Consider using VERP to review practice, either individually or as a group.	

5.3.2 EP practice in special schools

There are three broader implications of this study for educational psychology practice.

1. Let's do more collaborative research in special schools.

Recommendation 8 in the Rochford Review (DfE, 2016) specifically encourages special schools to engage in research to develop the knowledge base around what works for children with severe or profound and multiple learning difficulties. The autism research community also highlights the importance of undertaking projects collaboratively with schools (Parsons et al., 2013) as there is very little evidence to underpin practice (Imray & Colley, 2017). My experience during this project suggests that research based on a democratic partnership (Hall, 2001) worked well. Ben suggested that "*perhaps at this time every year we sit down and say, look, over the next twelve months these are the two things that we would like to work on… myself and other colleagues would welcome that*". Furthermore, my experience during this project suggests that TEPs are ideally placed to build on the work of academic researchers to help develop, disseminate and deliver interventions to school communities.

However, action research can be challenging. Parsons and Kasari (2013) state that conducting autism research in a school setting is not for the faint of heart. It is important to respond to the needs of the school (Kasari & Smith, 2013), simple solutions are not possible (Bergmark, 2020), and findings exist within a myriad of complex conditions. Charlotte shared "*we've all said that you respect that sometimes when you come in, it can't be as expected…*". Navigating the unexpected and complex conditions that existed during this project required me to draw on the consultative, collaborative and real-world research skills developed during my training, with the support of my experienced supervisor. This equipped me to respond flexibly to the needs of the school and to facilitate and empower school staff. In line with previous research (Carpenter et al., 2023; Crombie et al., 2014; Hampton et al., 2019) and my experience, EPs are well placed to support schools in this capacity.

2. Let's continue the focus on pedagogy and curriculum.

Imray and Colley (2017) assert that the dominance of the inclusion narrative has meant that there has been no serious attempt to look at the educational difficulties faced by learners with PMLD and SLD. Full

inclusion is neither a given nor unarguable truth (Imray & Colley, 2017) and social policies can be well-intentioned but ineffective in achieving what is intended (Kauffman et al., 2020). The National Curriculum is not an appropriate curriculum for students with complex and enduring needs (Gale & Gibbs, 2009), and there is a generation of children who have been denied appropriate pedagogy (Carpenter et al. 2016). The engagement model (DfE, 2020) has been received as a step in the right direction but there is still an insufficient focus on teaching and learning (Hinchcliffe, 2022). Charlotte shared that *"it's so hard to communicate with nonverbal students and to try and give them a curriculum that they need. It's such a hard thing to do. And I don't think that there's enough help or suggestions or anything like that to help staff to do that type of thing. I don't know."* My experience during this project echoes Charlotte's view. Pedagogy prevalent in our mainstream schools is being applied without due consideration of the students' unique needs, such as considerable overuse of highly stimulating clips on the interactive white board. Psychological knowledge of information processing and the theories relating to strengths and needs of autistic students is a good foundation from which to work with special schools to address this. In line with descriptions of our role (Farrell et al., 2006; Lyonette et al., 2019) EPs should be well placed to support pedagogical and curricular development, and many EPs already have (Carpenter et al., 2023; Crombie et al., 2014; Hampton et al., 2019; Rees et al., 2017).

3. Let's address the training needs of the profession.

During this project, despite significant additional reading, I felt a lack of confidence in my knowledge in relation to autism and SLD. This experience is reported by other EPs in relation to SLD and PMLD (Rees, 2017; Winter & Bunn, 2019). The social constructionist approach prevalent in EP thinking (Gale & Gibbs, 2009) may have influenced the development of professional training (BPS, 2019) such that knowledge about complex individual needs is not prioritised. Winter and Bunn (2019, p.70) suggest that we reflect on the inherent assumptions that come with the EP title: "educational psychology is about children and young people in educational settings, and tackles challenges related to learning difficulties, social and emotional problems, disability or complex developmental disorders." Therefore, echoing Winter and Bunn (2019), I believe that initial training should include knowledge and skill relevant to this area of practice.

5.4 Concluding comments

This study suggests that an Adult Interactive Style Intervention (Kossyvaki, 2017) can support the spontaneous communication of secondary aged autistic students with SLD. The study takes a further step forward in bridging the research to practice gap by investigating the delivery of this intervention through an educational psychology lens. It contributes to the evidence base within the profession of educational psychology, and it contributes to the intervention literature for an underrepresented group of students. Additionally, this study raises broader questions regarding policy and best practice in the education of students with SLD and PMLD, and the role EPs might play in shaping this.

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APPENDICES

Appendix A: General principles and communicative opportunities implemented in the original Adult Interactive Style Intervention (AISI) study

General principles	Principles relate to the adults' body language, speech and timing
1. Gaining the child's attention	The adult called or sang the child's name before addressing them; they may alternatively have said something like 'Hello xxx (child's name)', 'Where is xxx (child's name)?' or 'xxx's (child's name) turn' (modified from Prizant et al., 2006). The adult reduced distractions before trying to get the child's attention.
2. Establishing appropriate proximity or touch	The adult approached the child in distance less than 1 metre and might have touched them too (modified from Nind and Hewett, 2001).
3. Showing availability	The adult extended their hands towards the child having wide and questioning eyes (modified from Prizant et al., 2006).
4. Waiting for initiations	The adult set up the stage for interaction and waited for at least five seconds for the child to initiate (modified from Prizant et al., 2006).
5. Responding to all the child's communicative attempts	The adult gave the object the child asked for, took away the object they protested for, allowed them to start and terminate activities when they communicated these. In cases that the child could not finish their activity yet or have the object they wanted, the adult acknowledged the communicative attempt and indicated steps for completion of the present task (modified from Prizant et al., 2006).
6. Assigning meaning to random actions or sounds	The adult reacted as if the child's behaviour was communicative, even when it was not (modified from Christie et al., 2009).
7. Imitating the child	The adult imitated the child's verbal (e.g., vocalisations, words) or non-verbal (e.g., actions) behaviour (modified from Prizant et al., 2006).

8. Following the child's lead/focus of attention	The adult joined in what the child was doing or commented on it (modified from Prizant et al., 2006).
9. Using exaggerated pitch, facial expressions, gestures and body language	The staff used animated pitch and exaggerated facial expressions, gestures or body language (modified from Kaufman, 1994; Greenspan and Wieder, 1998).
10. Expanding on the child's communicative attempts	The adults' utterance was the length of child's utterance plus one (modified from Rogers and Dawson, 2010).
11. Using minimal speech	The adult used up to four relevant concrete words and mapped them exactly onto aspects of the situation in hand (modified from Potter and Whittaker, 2001).
12. Providing time to process information	The adult gave the child verbal or non-verbal information and provided them with at least five seconds to process the given information (modified from Nind and Powell, 2000).
13. Using non-verbal cues	The adult used symbols or pictures, objects of reference, gestures, body language, physical prompts or Makaton signs to support the child's understanding (modified from Prizant et al., 2006).
Communicative opportunities	**Situations adults set up in which the child is likely to initiate communication**
1. Offering choices	The adult gave a choice of activity or food without any verbal prompt; the adult might have held out two objects for the child to choose or provided the child with a photo choice board (modified from Potter and Whittaker, 2001; Prizant et al., 2006).
2. Stopping part-way	The adult stopped part-way through a child's favourite activity, when it was in its peak (modified from Potter and Whittaker, 2001).
3. Giving small portions of food or drink	The adult gave the child small portions of food or drink so that the child could ask for more (Potter and Whittaker, 2001).
4. Making items inaccessible	The adult put items in sight but out of reach so that the child needed to ask for them (Potter and Whittaker, 2001).

5. Giving the child materials they will need help with	The adult gave the child materials they could not make them work without the adult's help (e.g., wind-up toys, toys in containers) (Potter and Whittaker, 2001).
6. Contradicting the child's expectations	The adult did something out of routine or unexpected (Potter and Whittaker, 2001).
7. Giving the child non-preferred items	The adult gave the child items they were not interested in to elicit protest or comment (Potter and Whittaker, 2001).
8. 'Forgetting' something vital	The adult set up a situation where they did not do something of vital importance; this could be to give the child paper without crayons in colouring time or putting on child only one shoe (Christie et al., 2009).

Appendix B: Information and consent form for parents

RESEARCH STUDY ON COMMUNICATION

Dear Parent/ Carer,

My name is Natasha Davies and I am a trainee educational psychologist. I am running a research project as part of my training and am writing to you because I am seeking consent for your child to take part.

Before you decide whether you would like your child to take part, please read this leaflet so that you understand why the research is being conducted and what it will involve. If you would like further information, please get in touch.

Purpose of the study

This study is about how adults can facilitate students to communicate (verbal and non- verbal) more often and for different purposes. I will be working together with school staff to agree a set of principles that they will then implement and evaluate.

What will my child's involvement look like?

Your child's interaction and communication with others will be videoed at the start and at the end of the project so that it can be analysed in detail. School staff will fill in a questionnaire about your child's communication at the start and end of the project. School staff will also have an interview with me about the progress your child has hopefully made. Your child's school day will not look any different and no additional demands will be placed on your child.

What are the possible benefits of taking part?

I hope to see an increase in the quantity, and a possible change in the purpose, of your child's communication with others (verbal or non-verbal). This should have a positive impact on the long term goal of supporting your child to communicate their needs and gain greater control over their environment. If the study works well, it could also inform support for other children. I also hope that the staff will find the experience useful and that it will add to their professional development.

What are the possible risks of taking part?

There is minimal risk to the children. It is possible that a child may find being videoed, or the presence of a new person upsetting. To avoid this, I will be visiting school regularly to get to know the children and class I will be working in. I will ask the children for permission to video their learning before doing so. If your child's behaviour suggests that they are unhappy or that my presence is upsetting, I will stop videoing immediately. I will liaise closely with adults who know the children well to ensure my presence has no negative impact on the children's wellbeing.

If I change my mind, can I withdraw my child from the study?

Yes. If at any point during the study you wish to withdraw your child, you can tell the researcher or school. You do not have to give a reason. If, after the study, you want to withdraw your child's data, you have one month from the end of the study to inform the researcher of this. Any data already collected would be destroyed.

Will my child's information be kept confidential in this study?

Yes. General Data Protection Regulation (GDPR) along with the Data Protection Act 2018 (DPA) will apply to the handling, processing and destroying of all data. All data collected will be kept strictly confidential and stored securely. The data will be destroyed 10 years after the research is completed.

What will happen with the results of the study?

You will receive a short report about your child's involvement and any progress they have made.

The results of the study will be written up as part of my thesis for the Doctorate in Applied Educational and Child Psychology. The study may also be written as a journal article and submitted for publication to a relevant professional journal. The work may be presented at conferences. Your child's name (and the name of the school and all other research participants) will remain anonymous at all times but details such as your child's age, general communicative ability and diagnosis of autism will be included in any write ups.

Who is organising the research?

The research is organised by the University of Birmingham and Coventry Educational Psychology Service.

Who has reviewed the study?

This research project has been approved by the Humanities and Social Science Ethical Review Committee at the University of Birmingham.

What do I do next?

If you are happy for your child to participate in this study, please complete the consent form attached. If you have any questions please do not hesitate to contact me.

Contact details for further information

Natasha Davies (Trainee Educational Psychologist, Coventry City Council)

Dr Anita Soni (Research Supervisor, University of Birmingham)

Thank you very much for taking the time to read this information leaflet and for considering your child's participation in the study.

STUDENT CONSENT FORM

Dear Parent/ Carer

Please find the consent form for your child's participation in the communication study. I would be grateful if you could complete it and return it to school as soon as possible.

I have read and understood the project information leaflet.	Yes / No
I have been given the opportunity to ask questions about the project.	Yes / No
I agree for my child to take part in the project as described in the information leaflet.	Yes / No
I agree to the researcher accessing my child's school progress data, their Education Health and Care Plan, and discussing their communicative ability with speech and language colleagues.	Yes / No
I agree that my child's communication will be videoed at the start and end of the project.	Yes / No
I understand that my child's participation is voluntary. I understand that I can withdraw my child from the study at any time. If, after the study, I want to withdraw my child's data, including video data, I have one month to inform the researcher. I know that I do not have to give any reasons for withdrawing data.	Yes / No
I agree that the results of the study will be written in a report for the researcher's university thesis and may later be published in an academic journal. I understand that my child's name or the name of the school they go to will not be included in these reports. I understand that some basic details about my child will be included in these reports e.g. age, sex, communicative ability, special educational needs, diagnoses.	Yes / No
I agree for the data my child provides to be stored securely by the researcher for 10 years and then be destroyed.	Yes / No

Child's Name _____

Parent/ Carer Name _____

Signature _____

Date _____

Appendix C: Information and consent form for staff

RESEARCH STUDY ON COMMUNICATION

Dear Staff Member,

This information leaflet has been given to you because we are seeking your consent to take part in a research project about communication. The project is being run by a Trainee Educational Psychologist, Natasha Davies, as part of her doctoral thesis at the University of Birmingham. Before you decide whether you would like to take part, please read this leaflet so that you understand why the research is being conducted and what it will involve. If you would like further information, please do not hesitate to contact us.

Purpose of the study

The purpose of the study is to investigate the impact of an Adult Interactive Style Intervention (AISI) on the spontaneous communication of children with autism. The project will involve the collaborative development of a set of general principles and communicative opportunities for staff to use in the classroom to support young people to initiate communication more frequently.

What will happen if I choose to take part?

If you choose to take part in this research you will be asked to sign a consent form. Once you and the student participants have given their consent, the research study will begin. The study will take place over a school term. Your involvement will include:

Pre-Intervention
Video will be used by the researcher to capture the students' communication.
Staff will be asked to complete a questionnaire about students' communication.

Development of the Adult Interactive Style Intervention
Three 1-hour training sessions to share research- based and practice-based knowledge to develop a set of general principles and communicative opportunities to encourage spontaneous communication from students. These strategies will form the basis of the Adult Interactive Style Intervention.

Intervention Implementation
Staff will be asked to incorporate the agreed strategies into their daily practice.
Staff will be asked to fill in a brief weekly checklist about the strategies being used.

Post- Intervention
Video will be used to capture the students' communication, as pre-intervention.
Staff will be asked to complete a questionnaire, as pre-intervention.
Staff will be interviewed individually to find out their views about the students' progress and their involvement in the intervention.

Feedback and Evaluation
A focus group will be held for all staff involved

- Researcher to feedback results and outcomes
- Staff to evaluate and reflect on the project and their involvement

What are the possible benefits of taking part?

We hope to see an improvement in the quantity and purpose of students' communication. Finding out whether the intervention works well in a secondary context could also help other young people with autism in secondary special schools. We also hope that staff find the experience empowering and helpful in terms of developing their professional skills and knowledge. The action research methodology allows staff to become as involved as they would like to be and this could be beneficial in terms of future professional opportunities.

What are the possible risks of taking part?

There is minimal risk to staff or the students. However, below is an outline of conceivable risks and how they will be managed.

- You may find being videoed uncomfortable initially. However, the focus will be on the student and no data is collected on your practice throughout the project except that which you report yourself. The video cannot be used for performance evaluation purposes and is only accessible to the researcher. The researcher may choose to share short clips of existing good practice in the training sessions but should you prefer not to have footage of your practice shared, you can indicate this on the consent form.
- You may be concerned about additional workload. This should be negligible as the intervention is naturalistic and does not lead to additional demands or changes to the school day. The researcher will work with senior leaders to arrange for training to take place in designated CPD slots. The questionnaire and checklist are brief but the post- intervention interview and focus group may take up to an hour.

If I change my mind, can I withdraw from the study?

Yes. If at any point during the study you wish to withdraw, you can inform the researcher or school senior leaders. You do not have to give a reason and there would be no consequences to you or your professional reputation. If, after the study, you want to withdraw your data, you have one month from the end of the study to inform the researcher of this via e-mail. Any data already collected would be destroyed.

Will participant information be kept confidential in this study?

Yes. General Data Protection Regulation (GDPR) along with the Data Protection Act 2018 (DPA) will apply to the handling, processing, and destroying of all data. All data collected will be kept strictly confidential and stored securely. The data will be destroyed 10 years after the research is completed.

What will happen with the results of the study?

A summary of key findings will be shared with you during the feedback and evaluation focus group. In addition, the results of the study will be written up as part of the researcher's thesis for the Doctorate in Applied Educational and Child Psychology. The study may also be written as a journal article and submitted for publication to a relevant professional journal. The work may be presented at conferences. Your name (and the name of the school and all other research participants) will remain anonymous at all times but details such as your job role may be included.

Who is organising the research?

The research is organised by the University of Birmingham and Coventry Educational Psychology Service.

Who has reviewed the study?

This research project has been approved by the Humanities and Social Science Ethical Review Committee at the University of Birmingham.

What do I do next?

If you are willing to participate in this study please complete the consent form and the researcher will liaise with your school regarding dates to begin the study.

Contact details for further information

Natasha Davies (Trainee Educational Psychologist, Coventry City Council)

Dr Anita Soni (Research Supervisor, University of Birmingham)

Thank you very much for taking the time to read this information leaflet and for considering your participation in the study.

STAFF CONSENT FORM

Dear Staff Member,

Please find the consent form for your participation in the study to investigate the impact of an Adult Interactive Style Intervention on the spontaneous communication of students. I would be grateful if you could complete it and return it to me at your earliest convenience.

I have read and understood the project information leaflet.	Yes / No
I have been given the opportunity to ask questions about the project.	Yes / No
I agree to take part in the project as described in the information leaflet.	Yes / No
I agree that my voice will be recorded in the interview and focus group.	Yes / No
I understand that when the students' communication is videoed, I am also going be in the frame. The video footage will only be accessible by the researcher and no data will be collected on my practice using video.	Yes / No
If existing good practice is captured during initial videoing, the researcher may choose to share some of this during the training sessions. I agree to a clip of my existing good practice being shared with others during the training sessions.	Yes / No
I understand that my participation is voluntary. I understand that I can withdraw from the study at any time. If, after the study, I want to withdraw my data, I have one month to inform the researcher. I know that I do not have to give any reasons for withdrawing data.	Yes / No
I agree that the results of the study will be written in a report for the researcher's university thesis and may later be published in an academic journal. I understand that my name or the name of the school I work in will not be included in these reports. I understand that some basic details about me will be included in these reports e.g. role held.	Yes / No
I agree for the data I provide to be stored securely by the researcher for 10 years and then be destroyed.	Yes / No

Name _____

Signature _____

Date _____

Appendix D: The Leuven Scales for well-being and involvement

Level	Well-being	Signals
1	Extremely low	The child clearly shows signs of discomfort such as crying or screaming. They may look dejected, sad, frightened or angry. The child does not respond to the environment, avoids contact and is withdrawn. The child may behave aggressively, hurting him/ herself or others.
2	Low	The posture, facial expression and actions indicate that the child does not feel at ease. However, the signals are less explicit than under level 1 or the sense of discomfort is not expressed the whole time.
3	Moderate	The child has a neutral posture. Facial expression and posture show little or no emotion. There are no signs indicating sadness or pleasure, comfort or discomfort.
4	High	The child shows obvious signs of satisfaction (as listed under level 5). However, these signals are not constantly present with the same intensity.
5	Extremely high	The child looks happy and cheerful, smiles, cries out with pleasure. They may be lively and full of energy. Actions can be spontaneous and expressive. The child may talk to him/herself, play with sounds, hum, sing. The child appears relaxed and does not show any signs of stress or tension. He/she is open and accessible to the environment. The child expressed self-confidence and self-assurance.

Level	Involvement	Signals
1	Extremely low	Activity is simple, repetitive and passive. The child seems absent and displays no energy. They may stare into space or look around to see what others are doing.
2	Low	Frequently interrupted activity. The child will be engaged in the activity for some of the time they are observed, but there will be moments of non-activity when they will stare into space, or be distracted by what is going on around.
3	Moderate	Mainly continuous activity. The child is busy with the activity but at a fairly routine level and there are few signs of real involvement. They make some progress with what they are doing but don't show much energy and concentration and can be easily distracted.
4	High	Continuous activity with intense moments. They child's activity has intense moments and at all times they seem involved. They are not easily distracted.
5	Extremely high	The child shows continuous and intense activity revealing the greatest involvement. They are concentrated, creative, energetic and persistent throughout nearly all the observed period.

Appendix E: Questionnaire regarding quantity, function and method of spontaneous communication in students

STUDENT	
STAFF	
DATE	

Instructions: First read the information boxes. Take time to have any questions clarified, then please complete the questions.

What is communication?

Communication is an act where there is a message/ something to communicate about, a sender, a receiver, a method of communication, and communicative intent. The method could be verbal or non-verbal. It could include speech, symbols, vocalisation, gesture, pointing, actions, eye contact, or gaze switching.

What is *spontaneous* communication?

Spontaneity exists on a continuum. Each communicative act has a degree of spontaneity. Contextual and environmental stimuli such as prompts, instructions and verbal cues can range from having a minimal to a most intrusive impact on the speaker. To support spontaneous communication, adults need to provide the right level of prompting or scaffolding. Modelling and using direct prompts is an important part of this but for the purposes of this study, we are defining spontaneous communication as communication that occurs in the absence of prompts that *directly elicit* a specific communicative act by the learner and *specify the content and/ or form* of the act (Carter & Hotchkis, 2002).

Developed using the Questionnaire for Determining Spontaneous Communication in Children – QDSCC (Kossyvaki et al., 2012); and The Modified Classroom Observation Schedule to Measure Intentional Communication - M-COSMIC (Clifford et al., 2010).

Please complete the table below for the student being discussed:

Function	Quantity	Method(s) Used
To **request an object** e.g. snack, toy OR **request an action** e.g. help, more		
To **protest or refuse** an undesired object or adult request		
To request **social routine** e.g. hugging or games/ activities that are interpersonal in nature		
To refer to an event, object or action in order to **comment or share attention** with a partner		

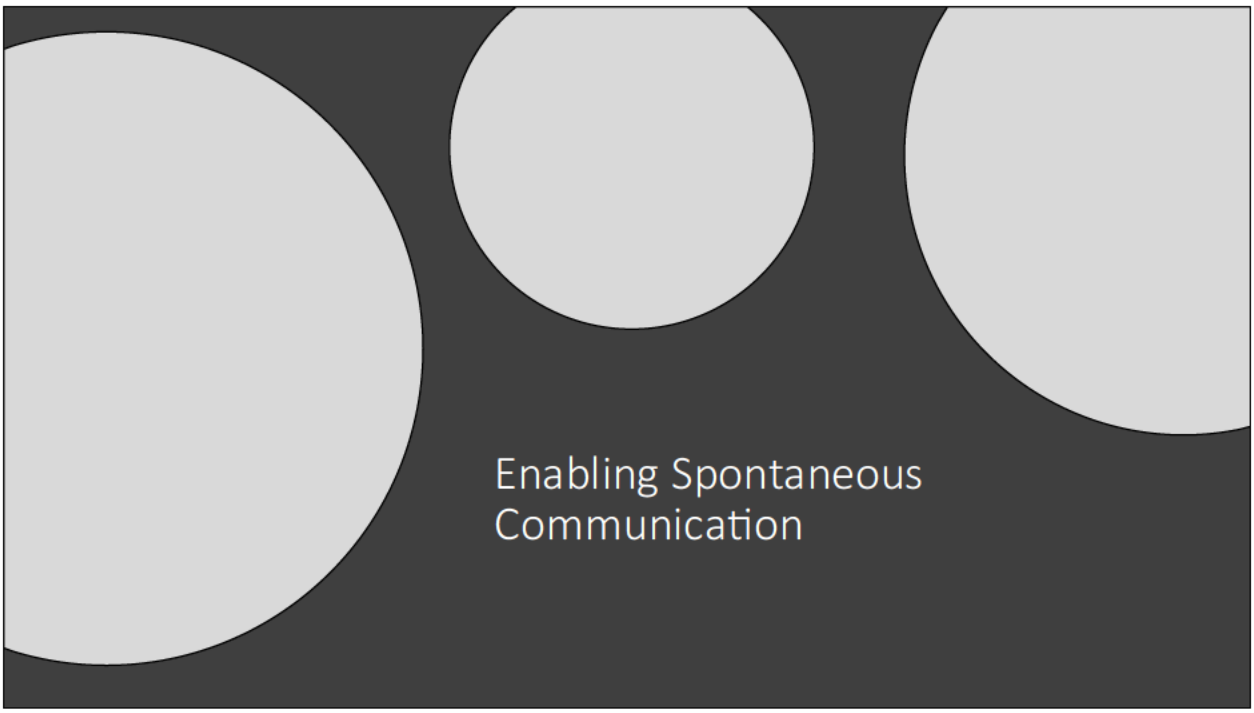
Quantity	Method(s) Used
Not at all Not often Often Very often	Speech (S) Picture/ symbol/ Makaton/ sign (P) Gesture/ Pointing (G) Action (A) Vocalisation (V) Distressed Behaviour (DB)

Appendix F: Communication Profiles (Mar & Sal, 1999)

Skill Level	Description	Student 'best fit'
1	**Key attributes: nonsymbolic, reactive, nonintentional, nonspecific**. Individual orients to and responds to the source of stimulation with simple reactive or reflexive behaviors. These behaviors are generally nondifferentiated and must be interpreted by care provider as expressing certain internal states or needs. Responses and behaviors are specific to immediate situations or needs. Examples: (1) fusses and then quiets when given a drink; (2) startles and shifts body when approached by teacher or momentarily orients to person entering room.	
2	**Key attributes: nonsymbolic, reactive, preintentional, simple specific behaviors**. Individual produces nonsymbolic behaviors, such as a single action or vocalization, in response to stimuli. Behaviors may be intentional, but are not differentiated (e.g., moves hand in specific gesture to indicate want, yet also uses same gesture at other times). Behaviors may be consistent from day to day and across similar situations, and their meanings can often be interpreted by the familiar care provider in the context of the situation. Individual may not communicate in deliberate turn-taking fashion but, rather, may gratify his or her needs at an "object level", i.e., by acting directly upon objects or persons that are physically present. Examples: (1) alternates glance between two objects and then fixates on cup to indicate choice; (2) smiles when seeing a familiar person.	**Billy**
3	**Key attributes: presymbolic, single behaviors, preintentional, simple specific responses**. Individual communicates mostly through direct behaviors and actions, such as simple gestures. The behavior, itself, is often the message and as such, it may not be a true symbolic representation. However, there may be fragmented use of a few conventional symbols, such as words or sign approximations for labeling people and objects. Communication is directed toward other persons, and the individual is aware that his or her behaviors directly impact others' actions. He or she may initiate a simple interaction and participate in simple turn-taking. Communicative behaviors are closely associated with immediate activities or needs. Behaviors are typically generalized across similar situations, are used with consistency, and are readily deciphered by familiar persons. Examples: (1) extends empty cup toward teacher to indicate desire for more juice; (2) waves "hello" in response to another person initiating the interaction.	**Charlie**
4	**Key attributes: presymbolic to symbolic, single behaviors/symbols, basic intent, emerging reciprocity.** Individual uses a mix of behaviors and conventional symbols. Some of the utterances or signals are true symbolic representations. Symbols and behaviors are expressed mostly in single form (e.g., one-word utterance or pointing to one picture), but the ability to use some simple combinations may be emerging. Symbols are used for labelling needs, objects, events and persons. The individual is able to express needs, wants, and comments directly to others. Understanding of reciprocity is emerging such that interaction can be either initiated or continued with an appropriate response. Examples: (1) points to juice container and signs "more"; (2) waves "hello" to initiate interaction with another person.	**Adam**

Appendix G: Adult Interactive Style Intervention training slides

(Photos and video clips removed for anonymity)



Outline

1. What is the research project?
2. What is spontaneous communication?
3. What can we do to enable spontaneous communication?

1. What is the research project

The Plan

The Approach

Collaborative Action Research

2. What is spontaneous communication?

What is communication?

"An act where there is a message/ something to communicate about, a sender, a receiver, a medium of transmission, and communicative intent."

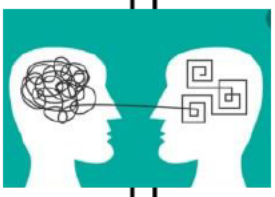
What is spontaneous communication?

Imitation	Give cue	Highlight stimulus	Natural cue
Model AAC and child imitates. Adult says "say water" and child imitates "water".	Adult present choice of two drinks, child requests a drink. Adult presents communication board, child requests a drink. Adult asks the child "Charlie, drink?" with expectant look and child requests a drink.	Adult pours drink with exaggerated action near child and child requests a drink. Adult moves drink near child, or within sight but out of reach, and child requests a drink.	Child prompted by natural context or internal cue of thirst and requests a drink.

LESS SPONTANEOUS MORE SPONTANEOUS

Spontaneous communication in the context of -

THEORY OF MIND DIFFICULTIES

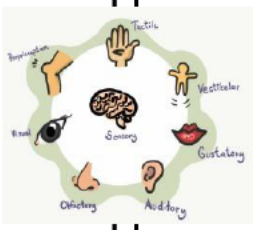


Motivation

EXECUTIVE FUNCTIONING

Regulation of
- Attention
- Movement
- Emotions

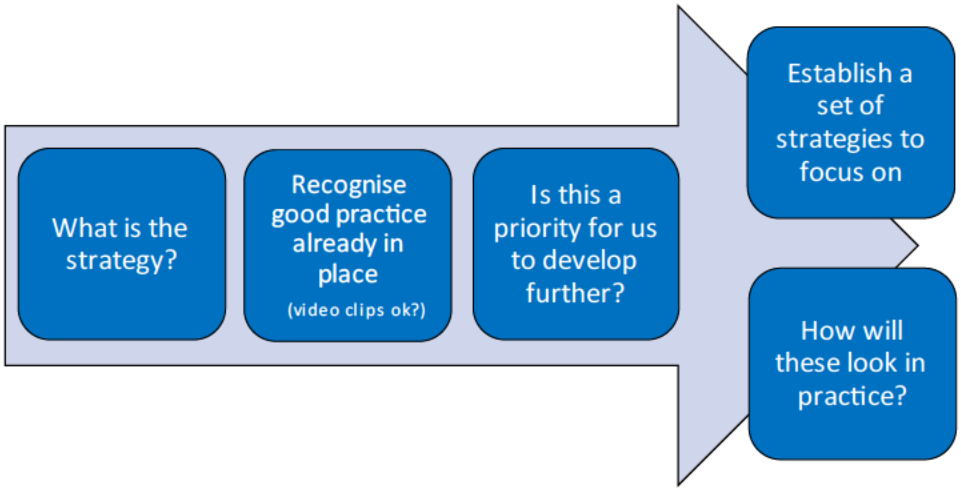
SENSORY PROCESSING DIFFERENCES



Individual hyper and hypo sensitivities

3. What can we do to enable spontaneous communication?

The Process



Opportunity 1: Offering choices

Present children with choices as often as possible (Prizant et al, 2006)

Recommendations from research

- Offer two choices, using clear visual cues, and vary the order in which they are presented.

Opportunity 2: Stopping part way

Stopping part way through a child's favourite activity is an effective way to elicit a request to continue (Potter and Whittaker, 2001)

Recommendations from research

- Sing the child's favourite songs and drop the ending Sonders, 2003)

Opportunity 3: Giving small portions

Provide equipment bit by bit so the child has the opportunity to ask for more. (Potter and Whittaker, 2001)

Recommendations from research

- This can also be done with food e.g. pieces of chocolate.

Opportunity 4: Making items inaccessible

Put items in sight but out of reach so the child needs to ask for them. (Potter and Whittaker, 2001)

For example - Keep a favourite toy/ item on a high shelf so that it needs to be requested.

Recommendations from research

- Use items of high interest or the child is unlikely to be motivated to ask. Try this on a day when the child is otherwise settled to avoid frustration or too much change.

Opportunity 5: Giving materials the child will need help with

Give materials the child cannot make work themselves and for which they need to request an adult's help. (Potter and Whittaker, 2001)

For example - Give chocolate bar with wrapper on, give Tupperware with lid on tightly

Recommendations from research

- Vary the ways in which you do this.
- Choose items that motivate but do not distress the child.

Opportunity 6: Contradict expectations

When adults contradict the child's expectations, perhaps by doing something unexpected and out of routine, it is possible that the child will request or comment (Potter and Whittaker, 2001; Griffin and Sandler, 2010)

For example - When helping a child put their socks and shoes on, put their socks on their hands instead of their feet.

Recommendations from research

- If the child does not notice, model the comment yourself.

Principle 1: Gaining the child's attention

Gain attention prior to attempting communication.

Recommendations from research

- Cut down distractions, including noise (Christie, 2009)
- Pick the appropriate moment (Ware, 2003)
- Develop a range of strategies for catching and holding attention – sing song voice, blow on cheek, round & round garden. (Ware, 2003)

Principle 2: Establishing appropriate proximity or touch

Physical contact is an essential part of communication with children who are pre-verbal (Nind & Hewett, 1994)

Recommendations from research

- Get down to the child's level (Prizant et al, 2006)
- Position yourself below the child's level to increase security (Nind & Hewett, 2001)
- Various measurements/ exact distances specified in the research (!)

Principle 3: Showing availability

Showing availability is a subtle behaviour that may need to be more prominent or exaggerated when a child has learning difficulties. Noticing *when* to show availability is key.

Recommendations from research

- Open your hands toward the child with questioning eyes, tilt head slightly backwards and to the side (Prizant et al, 2006; Nind & Hewett, 1994)
- Move into a helping position (e.g. near child/ near desired object) and show availability in anticipation of a request

Principle 4: Waiting for initiations

Waiting is an integral element of a responsive environment (Ware, 2003).

Recommendations from research

- Give time and wait for initiations. Behave as though you are expecting a response for longer than feels comfortable. Because children with autism often don't respond, adults stop waiting/ expecting it. (Ware, 2003).
- Children need additional processing time.

Principle 5: Responding to the child's communicative attempts

"No matter how much internal forces may prompt, if the effort to communicate goes unnoticed, the power and desire to communicate will lessen" (Dale, 1990)

Recommendations from research

- Adult to give the object asked for, take away the object protested against, allow the child to start and terminate activities
- When this is not possible, acknowledge the communicative attempt and indicate steps for completion of the present task (Prizant et al, 2006) e.g. now and next
- Adults will often 'get it wrong' due to the high degree of interpretation/ guess work required, but it is still important that an attempt at communication gets a result (Grove et al, 2000)

Principle 6: Imitating the child

By imitating the child, adults create a turn taking pattern and children become more aware of themselves when they have their behaviour reflected.

Recommendations from research

- Adults turn to be the same length as the child's (Sonders, 2003)
- Imitation should not be wooden but a 'flowing dance' containing elements of surprise and fun. Vary pitch/ pace. Try whispering, or going slow/ fast.
- Try vocalising through a cardboard tube or echo mike, a drum or another sound maker to copy the child's sounds.

Principle 7: Following the child's lead or focus of attention

Following what the child does, or commenting on it, is essential when trying to foster their spontaneous communication (Prizant et al., 2006)

Recommendations from research

- Provide a commentary using simple language (Nind & Hewett, 1994)
- Commenting rather than questioning
- Sing or chant the commentary to a known nursery rhyme e.g. This is the way we… (Christie et al. 2009)

Principle 8: Using minimal speech

Use few relevant concrete words and map them exactly onto aspects of the situation at hand
(Potter & Whittaker, 2001)

Recommendations from research

- Repeat the phrase if necessary but do not change the order of the words as children will process the information as a chunk or whole (Erith, 2003)
- Use the +1 principle (Prizant et al, 2006)

Principle 9: Using non-verbal cues

Use gestures, prompts, body language, objects of reference, photos, symbols and signs to support language (Prizant et al, 2006).
90% of communication is non -verbal (Borg, 2008)

Recommendations from research

- MODEL MODEL MODEL (to support receptive AND expressive language)
- Signs to be delivered alongside speech which helps adults to slow down their speech and emphasise key words (Christie et al., 2009)

Appendix H: Examples of communicative opportunities implemented by staff

COMMUNICATIVE OPPORTUNITY	EXAMPLES	**BOLD: Examples evident pre- intervention and highlighted in film footage during training sessions** *ITALICS: Additional examples discussed during training/ supervision sessions*
1. Give a choice of activity, equipment, or food	**Adult gives student choice of reward so student can request/ refuse** **Adult gives student choice of two learning activities so student can request/ refuse** **Adult gives student choice of paint colour so student can request/ refuse** *Adult gives choice of water or squash so student can request/ refuse* *Adult presents student with choice of two high interest activities using communication in print (toilet/ computer/ food cupboard) so he can request/ refuse*	
2. Stop part way through an enjoyable activity	**Adult stops part way through sensory feather activity repeatedly with student so he can request more** **Adult stops part way through foot massage with student so he can request more** **Adult stops part way through spinner activity with student so he can request more** **Adult stops partway through blowing bubbles/ blowing balloon so student can request more** *Adult stops part way through tacpac activity so student can request more* *Adult stops partway through a film clip so student can request more* *Adult stops partway through tickling game or other burst/ pause activities so student can request more* *Adult stops part way through a song so student can request more*	
3. Give small portions of materials/ food	**Adult gives student small cup of water during water play so he can request more** *Adult gives student small piece of fruit during snack time so he can request more* *Adult gives small squeeze of paint so student can request more*	
4. Make items visible yet inaccessible	*Adult introduces a new toy of interest to student one day and places it on high shelf for student to request the following day* *Adult places an afternoon snack (treat) in a visible yet inaccessible location*	
5. Give materials the student will need help with	**Adult provides challenge with learning activity (e.g. shape sorter) so student can request help** *Adult gives student Tupperware with lid on tightly so student can request help* *Adult gives student chocolate bar with wrapper on so student can request help*	
6. Contradict expectations	*Adult places student's socks on hands when helping them get dressed or other 'silly' acts so student can comment* *Adult discovers that object of interest is not where it usually is so student can comment* *Balloon is blown up and released/ water balloon is popped on first and second go but not third so student can comment*	

Appendix I: Video observation schedule to measure quantity, function and method of spontaneous communication in students

Instructions: Spontaneous communication to be coded by method when present using partial interval time sampling. Function categories to be considered mutually exclusive. Schedule to be completed with reference to the definitions below.

Time Intervals (seconds) & Function of Communication	30	60	90	120	150	180	210	240	270	300	
Behaviour Regulation											
Request object/ action											
Refusal/ protest											
Social Interaction (dyadic)											
Social routine											
Showing off/ attention											
Acknowledgement											
Joint Attention (triadic)											
Comment											
Request information											

Communicative method	Code
Speech	S
Picture/ Symbol/ Makaton/ Sign	P
Gesture/ Pointing	G
Action (including clear eye contact)	A
Vocalisation	V

Definition of communication	An act where there is a message/ something to communicate about, a sender, a receiver, a medium of transmission, and communicative intent (Bogdashina, 2022, p19)
Definition of spontaneous communication	Communication that occurs in the absence of prompts that directly elicit a specific communicative act by the learner and specify the content and/ or form of the act (Carter & Hotchkis, 2002)
Definitions of communicative functions	M-COSMIC (Clifford et al., 2010) definitions to be used (see Appendix J).
Definition of communicative methods	M-COSMIC (Clifford et al., 2010) definitions to be used (see Appendix J).

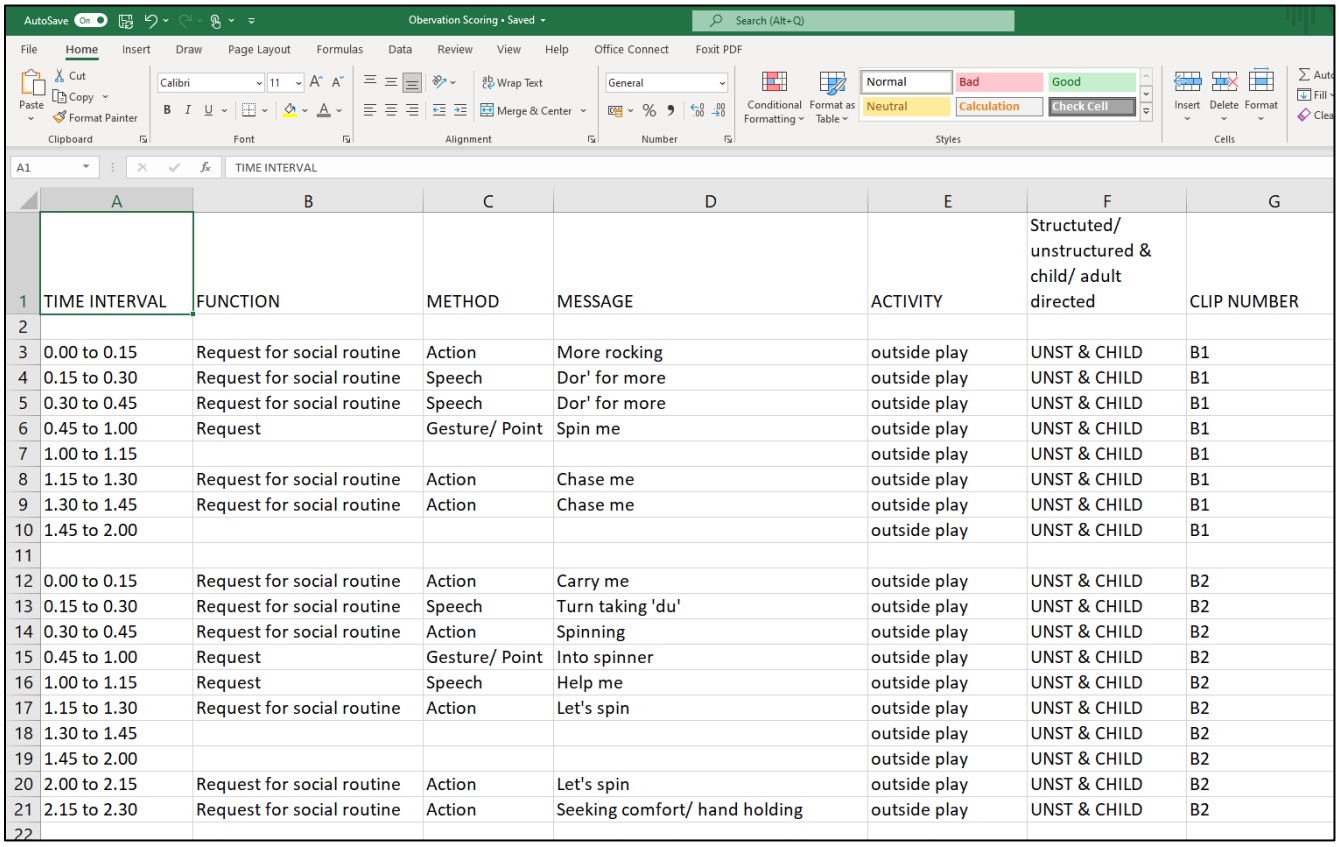
Appendix J: Summary of M-COSMIC definitions used for functions & methods

COMMUNICATIVE FUNCTIONS	
Behaviour Regulation	
Request object/ action	• Communication where an object (e.g. toy/ food) is requested or when 'help' with or 'more' of an object is requested
Refusal/ protest	• Communication used to refuse an undesired object or request, or a command for another to stop an undesired action
Social Interaction (dyadic)	
Social routine	• This code is used when a child makes a request for a game or activity that is clearly social or interpersonal in nature – such as tickling, hugging or other informal social routines • Also use this code when the child is attempting to have the interaction continue • This code may be used when the request is for a formal game or activity but not where the child is simply requesting that the adult facilitates an activity that will not involve them, such as switching the computer on, or reaching a toy that is on a high shelf (code this as request object/ action)
Showing off/ attention	• Communication used to attract another's attention to oneself - seeking attention or calling someone for affection or play
Acknowledgement	• Communication used to indicate notice of another person's previous statement or action • Involves the child focusing attention or shifting attention to the interactant e.g. Yep/ No/ OK/ mmmmm/ thanks response to questions or utterances
Joint Attention (triadic)	
Comment	• Comment is coded when a child refers to an event, object or action in order to share attention with a partner

Request information	• Communication used to seek information, explanation or clarification

COMMUNICATIVE METHODS	
Speech	• Single words, short phrases and whole sentences should be coded as a single bout of speech • Speech may include word approximations of speech of poor intelligibility as long as there is sufficient contextual information to identify what a child is saying e.g. 'ba' while holding a ball
Picture/ Symbol/ Sign/ Makaton	• This code includes the child giving or pointing to a symbol, picture, photograph, object of reference or other symbolic representation of an object, food item or activity
Gesture/ Pointing	• This code includes head nodding and shaking, pointing, descriptive, demonstrative or instrumental gestures such as or manipulating another's hand/ body as a tool
Action (including eye contact)	• This code covers a range of behaviours, including reaching, tapping, hitting out, or walking away • Eye contact will be included in this category rather than having a separate one – this could include persistently seeing eye contact or might include a three point shift in gaze to comment
Vocalisation	• Sounds that do not appear to have a speech like quality, but that are being produced for apparently communicative purposes, should be coded as vocalisation. This may include crying, moaning, waling of laughing, if used with apparent communicative intent

Appendix K: Example of video coding



	A	B	C	D	E	F	G
1	TIME INTERVAL	FUNCTION	METHOD	MESSAGE	ACTIVITY	Structuted/ unstructured & child/ adult directed	CLIP NUMBER
2							
3	0.00 to 0.15	Request for social routine	Action	More rocking	outside play	UNST & CHILD	B1
4	0.15 to 0.30	Request for social routine	Speech	Dor' for more	outside play	UNST & CHILD	B1
5	0.30 to 0.45	Request for social routine	Speech	Dor' for more	outside play	UNST & CHILD	B1
6	0.45 to 1.00	Request	Gesture/ Point	Spin me	outside play	UNST & CHILD	B1
7	1.00 to 1.15				outside play	UNST & CHILD	B1
8	1.15 to 1.30	Request for social routine	Action	Chase me	outside play	UNST & CHILD	B1
9	1.30 to 1.45	Request for social routine	Action	Chase me	outside play	UNST & CHILD	B1
10	1.45 to 2.00				outside play	UNST & CHILD	B1
11							
12	0.00 to 0.15	Request for social routine	Action	Carry me	outside play	UNST & CHILD	B2
13	0.15 to 0.30	Request for social routine	Speech	Turn taking 'du'	outside play	UNST & CHILD	B2
14	0.30 to 0.45	Request for social routine	Action	Spinning	outside play	UNST & CHILD	B2
15	0.45 to 1.00	Request	Gesture/ Point	Into spinner	outside play	UNST & CHILD	B2
16	1.00 to 1.15	Request	Speech	Help me	outside play	UNST & CHILD	B2
17	1.15 to 1.30	Request for social routine	Action	Let's spin	outside play	UNST & CHILD	B2
18	1.30 to 1.45				outside play	UNST & CHILD	B2
19	1.45 to 2.00				outside play	UNST & CHILD	B2
20	2.00 to 2.15	Request for social routine	Action	Let's spin	outside play	UNST & CHILD	B2
21	2.15 to 2.30	Request for social routine	Action	Seeking comfort/ hand holding	outside play	UNST & CHILD	B2
22							

Appendix L: Semi-structured staff interview schedule

Thank you for your participation in this communication study and for talking to me again now. I will be audio recording this interview using a Dictaphone so that I can capture everything accurately and so that I can analyse it afterwards. Straight after this interview, I will transfer the recording to an encrypted memory stick and delete it from the Dictaphone/ phone. Your views will be confidential. I won't name you or the school in the research. You can choose to withdraw your data for up to one month after the end of the study.

To recap the project, we have looked at the student's spontaneous communication (the purpose, method, frequency and spontaneity) of their USE of communication. We have focused on one aspect of how adults interact with students to develop this which is using communicative opportunities as often as possible to encourage the students to make their wants and needs known to others.

The interview will focus on –

- Whether there has been any change in the student's spontaneous communication following use of the communicative opportunities.

- Whether the 6 communicative opportunities we have looked at are useful in a secondary school setting, thinking in particular about our three target students.

- How you've found the project.

Topic	Question	Prompts
Student progress (RQ1)	How has your student been getting on generally? How has your student been getting on in terms of their spontaneous communication? Out of the three students, who do you think has made the most progress in terms of their spontaneous communication?	Look together at the competed questionnaire recording staff perceptions of the student's spontaneous communication pre-intervention (Appendix E). Looking at your views before we started, has there been any change in: - how regularly the student is communicating spontaneously? - the methods he is using? - the functions/ reasons for which he is communicating? Can you provide any examples?

Communicative opportunities (RQ2)	What do you think about the strategies we implemented in this project?	Look together at the competed check in questionnaire filled in during the supervision session (Appendix M). Looking at each communicative opportunity in turn: - how regularly did you implement this one? - why? Tell me more.. Can you provide any examples?
Project experience (RQ3)	If you told a colleague about this project, how would you describe it? Do you feel it has had an impact on your practice? In what way? Which element of the project did you find most helpful? Do you feel there have been challenges?	

Appendix M: Check in questionnaire

STAFF	
DATE	

Please indicate how many times daily you use each strategy with your target student.

COMMUNICATIVE OPPORTUNITY	NOT AT ALL	1 TO 3 TIMES	MORE THAN 3 TIMES
1. Give a choice of activity, equipment, or food			
2. Stop part way through an enjoyable activity			
3. Give small portions of materials/ food			
4. Make items visible yet inaccessible			
5. Give materials the child will need help with			
6. Contradict expectations			

Examples

Appendix N: Example of transcript coding

Charlotte	So the choice is fantastic. I think that should be used on everything. Every day, every minute of your classroom. With learning, with choice time, anything that you're doing should be given a choice of different things. So, I think that should always be the way. And, I think some people it would work for. We're just such a wide varied school and in navigator we have so many different navigator students. They're individually so different.	DN **Davies, Natasha** RQ2 Deductive analysis by communicative opportunity - Give a choice of activity, equipment or food DN **Davies, Natasha** RQ3 Data led analysis Code: Work for some not others Theme: Individual differences
Charlotte	So, it would have to work for... And you would have to be persistent with it and have it in your plan all the time, not just try and bring it in out of nowhere when the child's already in a bit of crisis.	DN **Davies, Natasha** RQ3 Data led analysis Code: Consistent approach Theme: Classroom environment and routines
Natasha	Yes, of course.	
Charlotte	I think... new year sevens and starting with new year sevens and having these communicative opportunities on your plan and trying to work with these to see whether it would work and to see whether it can boost their communication, I believe it could work. But again, it has to be... from the beginning in a new environment.	DN **Davies, Natasha** RQ3 Data led analysis Code: On plan from start Theme: Classroom environment and routines
Natasha	Yes. You can't suddenly start making things that have been accessible inaccessible sort of thing.	
Charlotte	Yes. Oh, definitely.	
Natasha	Of course. No that's great. Thank you. So, the next section then is about student progress. Do you think there has been any change in Charlie's communication, either positive or negative, during the course of this?	
Charlotte	There's more negative communication, because it's becoming a lot more distressed. Whether that could be... It could go from the materials to the day, to how he's feeling. It's more negative than positive that we've had off him recently.	DN **Davies, Natasha** RQ1 Deductive analysis by quantity, function and method of spontaneous communication – Charlie increased distressed behaviour (method)
Natasha	Has there been any change in the function of his communication? The purpose? I think we talked a bit previously about how he likes to have his feet rubbed and requests this social routine?	
Charlotte	We haven't had much of that recently at all. Not much of any tactile or any sensory feel sensology with him, because he's not... Because of the two hours that he's in we've tried to... He's started to go do his morning routine here and then go to forest school, because	DN **Davies, Natasha** RQ1 Deductive analysis by quantity, function and method of spontaneous communication – Charlie decreased social routine (function)

Appendix O: Example of critical realist thematic analysis

This appendix gives an example of the development of one staff level theme (competing pedagogical priorities, 4.2.3.3) identified in answer to RQ3 (Which factors impacted the success of the intervention?)

Analysis

Transcript data (empirical domain)	Data led descriptive code (real domain)	Theme (actual domain)
Interview question: How has Adam/ Billy/ Charlie been getting on in terms of their spontaneous communication?		
He's now responding to asking him to do things like pick thing up or, come on, sit back down on your chair. Normally you would have to go and guide him… (Charlotte)	Staff prioritise receptive communication in answer to question	Staff experience and manage **competing pedagogical priorities** and this may be related to the degree to which communicative opportunities were offered.
He is beginning to manage himself more effectively without that constant demand of me, me, me, this is what I need now, that we had several months ago. (Ben)	Spontaneous communication not always valued	
He's started to grasp that concept that he's not in control and it doesn't just belong to him all the time. So yes, I think we are making really good progress and most of the basics that we could possibly want are slowly falling into place. (Ben)	Importance of behaviour management to staff	
Yes, he's certainly understanding more. When the member of staff is communicating with him though Makaton or through symbol, he's understanding more of what that member of staff is then going to give him. (Ben)	Staff prioritise receptive communication in answer to question	
Because we are very much repetitive with him, it's a very basic, quite a narrow vocabulary, that we'll use with him, either through sign or through visual stimuli. He is beginning to show… And you can see it in terms of his regulation, he will accept a lot of things. Whether it's, as I say, someone else's turn or whether it's Billy choosing later or Billy choosing next. (Ben)	Importance of behaviour management and emotional regulation to staff	
Interview question: What do you think about the strategies we implemented in this project?		
It's hard to then try and 'stop part way' because he doesn't engage very much in something that he likes. So, I was looking, and I did try, and I can't do it because I enjoy	Importance of student	

seeing him enjoying the activity… So, it's a massive risk that one. I just thought, I'm not going to try that one. (Charlotte)	engagement to staff	
Five, yes. I think the more I've got to know L, possibly five, certainly in terms of helping him and supporting him moving forwards, would be a strategy that we would certainly look at. As he gets a little bit older and as he gets a little bit more settled and aware of our expectations. (Ben)	Importance of following routine and expectations to staff	

Quality Assurance

Question	Answer
Do my codes accurately describe the data they have coded (descriptive validity)?	Yes
When I use theoretical terms to unite codes, do they continue to accurately reflect the experiences in the data (interpretive validity?)	Yes
In the context of previous research and theory, does this theme explain the observable phenomena of interest (explanatory power)?	Yes