Intensive Interaction in mainstream primary schools: Supporting children with social, communication and interaction difficulties

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Thesis submitted to the University of Nottingham for the degree of Doctor of Applied Educational Psychology

May 2025

Word Count: 41,341

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Abstract

Intensive Interaction is an evidence-based approach supporting individuals at the early stages of communication, utilising the natural pedagogy of mother-infant interactions to promote recognisable and enjoyable social communication. As social, communication and interaction needs are prevalent within mainstream primary schools, this study evaluated Intensive Interaction within these settings, utilising mixed methodology. Five pairs of participants took part for approximately twelve weeks.

An AB single case experimental design (SCED) measured the impact of Intensive Interaction on early communication skills in phase one. Interactions were videoed twice weekly and evaluated using a framework created by the researcher measuring Communicative Methods, Attention and Engagement skills and Emotional Factors. Pre and post measures assessed Social Communication and Emotional Regulation using an adapted SCERTS (Social Communication, Emotional Regulation and Transactional Support) observation form (Prizant et al., 2003). During phase two, key adults experiences of Intensive Interaction were gathered via interview and analysed using Reflexive Thematic Analysis.

Results illustrate two of the five participants improved in Communicative Methods and Emotional Factors associated with early communication, and one improved in Attention and Engagement. Social Communication and Emotional Regulation reportedly increased for all participants.

Qualitative findings highlighted positive outcomes not directly measured by the SCED for the participants and the wider school community. Participant specific outcomes were inconsistent and dependent on contextual factors. Key adults found the approach uncomfortable, however embraced the training, consequently challenging their perceptions and the opinions of others. Factors which facilitated or hindered implementation are outlined, accentuating school values and the individual differences of key adults.

Limitations require acknowledgement, specifically generalisability due to research design. The study concludes Intensive Interaction can be successful within mainstream settings and contribute towards meaningful curricula; however, individual

differences of facilitators should be considered. Although factors increase success, and subsequent outcomes, the adaptive nature of Intensive Interaction is emphasised.

Acknowledgements

There are many people who I would like to acknowledge and thank for the support provided during this research project and during the entirety of the doctorate training:

The children, their families and school staff who agreed to take part in this research project, particularly the key adults who implemented the intervention, collected data and shared their experiences so openly.

My colleagues for their guidance and support, especially my placement supervisors.

The tutor team at the University of Nottingham for their supervision throughout the course and during the research project itself.

Cohort 17, for their friendship and emotional containment. I am so grateful to have been on this journey with you and look forward to our next steps as NQEP's.

To friends and family, especially Mother Doris, whose encouragement, patience and understanding throughout kept me going. I am looking forward to spending much more time with you all.

Finally, to Steve. Thank you for the ICT support, making me laugh during the hard times and for believing in me.

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List of Abbreviations and Acronyms

CoP	Code of Practice
CYP	Child or Young Person
EHCNA	Education, Health and Care Needs Assessment
EHCP	Education, Health and Care Plan
EP	Educational Psychologist
EPS	Educational Psychology Service
EYFS	Early Years Foundation Stage
FoC	Fundamentals of Communication
MMAT	Mixed Methods Appraisal Tool
PMLD	Profound and Multiple Learning Disabilities
RCT	Randomised Controlled Trial
RTA	Reflexive Thematic Analysis
RQ	Research Question
SCED	Single Case Experimental Design
SC&I	Social, communication and interaction
SENCo	Special Educational Needs Co-ordinator
SEND	Special Educational Needs and Disabilities
SLCN	Speech Language and Communication Needs
SLR(s)	Systematic Literature Review(s)
SLT	Senior Leadership Team
TA	Thematic Analysis
TEP	Trainee Educational Psychologist
UoN	University of Nottingham
WoE	Weight of Evidence

1. Introduction

1.1 Research Focus

The study broadly aims to add to the literature around supporting social, communication and interaction (S,C&I) needs within mainstream educational settings. Specifically, it focuses on evaluating the impact of Intensive Interaction on early communication skills. Historically used within specialist settings, Intensive Interaction uses the natural pedagogy of mother-infant interactions (Ephraim, 1986) to support learners to engage with others (Hewett, 2023). By focusing on mainstream educational settings, the study hopes to provide a unique contribution and a potential solution to the difficulties in supporting complex learners in mainstream schools.

1.2 Researcher's Personal and Professional Interest

The author's interest in communication and interaction stems from their previous experiences working within Early Years, and their awe when observing children's language develop over time. Having witnessed the difficulties which SC&I needs can pose to a child's development and their confidence in socialising with others, this interest has continued throughout the researcher's career, and during their Doctorate training in Educational Psychology.

Throughout the researcher's role as a Trainee Educational Psychologist (TEP), they have become acutely aware of the increased SC&I needs within mainstream educational settings, and subsequently the frequency of EP support requested by schools. The current context of Special Educational Need and Disabilities (SEND) within the UK means many are awaiting support from medical professionals or placement at SEND educational settings (DfE, 2022). Consequently, the researcher believes there are a high number of children with complex SC&I needs attending mainstream settings who are unable to access the national curriculum, and teaching staff are seeking alternative approaches to develop personalised curricula focused on their next steps of development. As an evidence-based practitioner, the researcher aims to evaluate the use of Intensive Interaction, within mainstream schools to support this population of learners.

1.3 Professional Relevance

This study has professional relevance for Educational Psychologists (EP's) as it investigates whether Intensive Interaction can be successfully implemented in mainstream schools and aims to measure the efficacy of the approach on children's early communication skills. The experiences of staff facilitating the approach are explored, alongside the factors perceived to support or hinder the use of Intensive Interaction within mainstream schools, enabling EP's to effectively support school staff delivering interventions to students with SC&I needs.

1.4 Aims and Structure of Thesis

This thesis will be presented in five chapters, including this introductory chapter. Subsections are utilised and detailed within the Table of Contents.

Chapter 2: Literature Review

Relevant literature is presented, focusing on SC&I needs and support provided to this cohort of students in educational settings. The outcomes of using Intensive Interaction are synthesised from previous research. The chapter concludes with the current study's rationale and research questions.

Chapter 3: Methodology

The philosophical paradigms influencing research design are outlined, leading to the methodological decisions made in the current study. The specific methodology utilised is described including measurement development and piloting procedures. Threats to reliability and validity are provided alongside mitigating actions.

Chapter 4: Results

The results chapter is presented in two separate phases, initially describing the quantitative outcomes for individual children, before presenting the key findings from the qualitative phase to explore the outcomes and experiences across the breadth of participants.

Chapter 5: Discussion

Results are considered in line with the literature presented within Chapter 2. The strengths and limitations are outlined, alongside implications for practice and future research. To conclude, the main findings are reiterated, considering the unique contributions of the current study.

2. Literature Review

2.1 Introduction to Chapter

This chapter describes the broad area of communication and interaction needs before considering the specifics for those with SC&I needs and the impact the present context of SEND may have on early identification and support. The importance of educational settings and professionals is outlined alongside the range of interventions appropriate for this cohort of learners, focusing specifically on the use of Intensive Interaction. A systematic literature review is utilised to highlight the outcomes and conclusions drawn from the published research studies in the area, before introducing the current study.

2.2 Communication and Interaction Needs

Communication and interaction needs are one of the broad areas of need defined in the SEND Code of Practice (CoP) (DfE & DoH, 2015). The definition in the CoP recognises the variety of difficulties which individuals may experience in this area.

> *"Children and young people with speech, language and communication needs (SLCN) have difficulty in communicating with others. This may be because they have difficulty saying what they want to, understanding what is being said to them or they do not understand or use social rules of communication. The profile for every child with SLCN is different and their needs may change over time. They may have difficulty with one, some or all of the different aspects of speech, language or social communication at different times of their lives."* (DfE & DoH, 2015, p. 97).

The prevalence of need in this area is significant, as the Office of National Statistics (2024a) stated that SLCN were the most identified primary need during the academic year 2023 to 2024, with over 290,000 pupils receiving SEND support, and an additional 78,000 pupils in receipt of an Educational Health and Care Plan (EHCP).

2.2.1 Speech, Language and Communication Needs

SLCN is a broad term used to describe all children and young people (CYP) with needs in this area, including those with specific language impairments, speech sound difficulties, and stammering, in addition to delays in speech and language

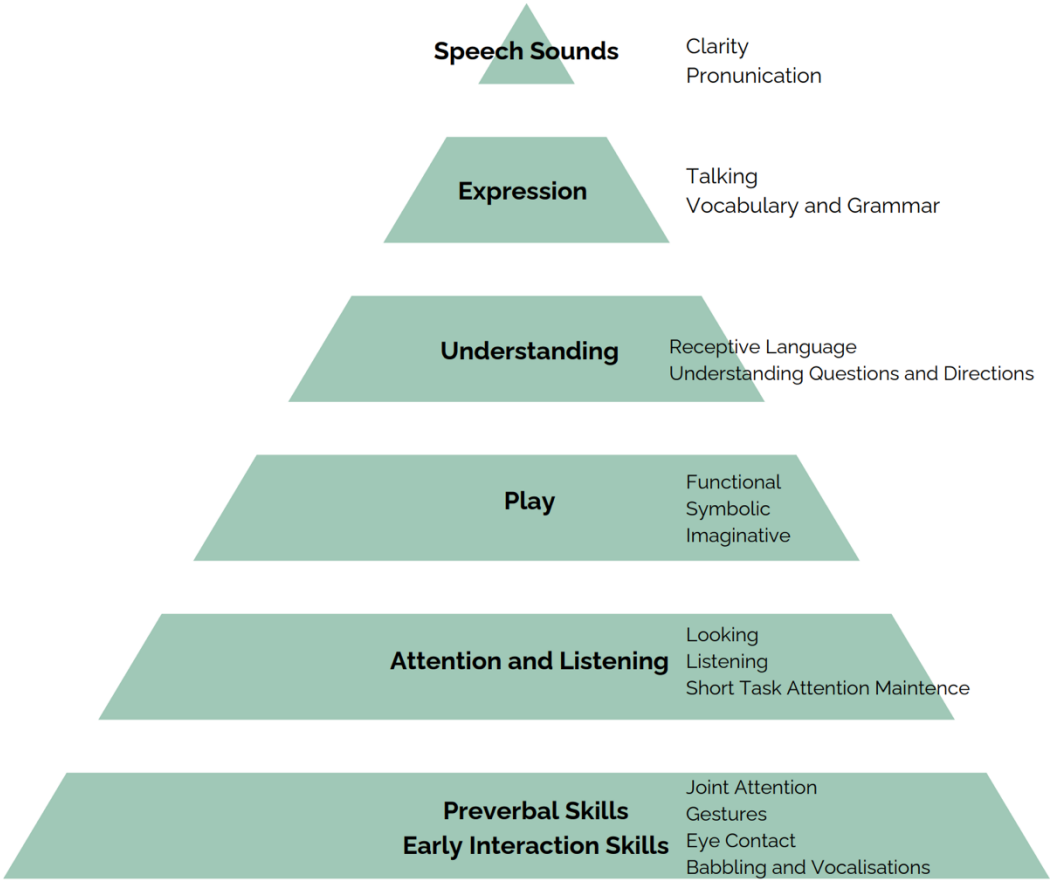
development or needs related to a wider profile of SEND (Gascoigne & Gross, 2017). Several environmental factors influence the acquisition of speech language and communication skills, including social disadvantage (Gascoigne & Gross, 2017) and for many, the impact of COVID-19 (Moyer, 2022).

Communication is key for development, learning, wellbeing and relationships. Research investigating the impact of SLCN highlight various poor developmental outcomes associated with delayed skills, including school readiness, acquisition of literacy skills and wider academic attainment data (Moroza-James, 2014; Gascoigne & Gross, 2017), in addition to poor mental health outcomes, diminished autonomy (Anderson, 2004) and impacting future life prospects such as independence and employment (Speech and Language UK, 2024).

Illustrated within developmental checklists and the Early Years Foundation Stage (EYFS) curriculum (DfE, 2023), communication development for individuals without additional needs is generally linear influencing the way in which developmental and educational professionals assess a child's development. One example, presented in Figure 1, suggests a hierarchal model of development.

Figure 1

The Communication Pyramid



Various versions of this model exist, broadly following the same theme (Morgan & Dipper, 2018) whereby early interaction skills are presented as the foundation for subsequent skill development, in line with developmental research (Bruner, 1983; Snow, 1977). Critics suggest this does not consider factors such as neurodivergence or differences in language development, skills progressing concurrently, in addition to emphasising speech as a goal (Morgan & Dipper, 2018), despite communication being achieved through alternative methods of communication (Anderson, 2004). Nevertheless, the communication pyramid presents a simplified view, often utilised by professionals working within communication and interaction (Morgan & Dipper, 2018) and highlights the importance of joint engagement and successful turn taking in vocalisations prior to mastering conversational skills (Adamson et al., 1985; Stern, 1988).

Each child develops at a unique pace, however there are rough estimates for early communication and interaction skill acquisition, which are highlighted to caregivers in the hopes of supporting early identification of difficulties, (Speech and Language UK, 2024). For example, children typically develop several non-verbal communication skills within the first year, such as eye gaze, vocalisations and gestures (Trevarthen & Hubley, 1978) and infants are born with an innate preference for aspects of social interaction, such as an interest in faces and 'motherese', referring to vocal interactions used by caregivers (Messer, 1994).

Despite an understanding of skill acquisition providing an important context for early identification, discussed in section 2.3.1, some argue as communication is defined as an activity which involves two or more people, the age of specific skill development is only one contributing factor for successful interaction (Anderson, 2004). Taking this lens, it is debated that communication first takes place at birth, when a mother greets her infant, and in subsequent caregiver-infant exchanges such as physical reassurance, vocalisations and exchanges of facial expressions (Bornstein & Bruner, 1989).

These moments of shared understanding and mutual engagement are referred to as the intersubjectivity (Trevarthen & Aitken, 2001) between an infant and their caregiver. Research highlights, in addition to behaviours which are instinctual for the purpose of survival signalling caregivers to respond to basic needs (Trevarthen, 2011), infants are born with skills which draw caregivers into social interaction such as synchronised and rhythmic patterns of behaviour (Reddy, 2008). In the earliest months, caregivers treat almost all an infant's behaviours as potentially communicative (Schore, 2021; Bruner, 1983), which is critical for enhancing social interaction skills (Siegal-Causey & Wetherby, 1993).

Over time, the caregiver becomes attuned to the infants communication style, cocreating an intersubjective reciprocal communication system conveying attention, emotion and meaning (Trevarthen & Aitken, 2001). By engaging in these pseudo dialogues (Schaffer, 1984), this develops an infant's understanding of other perspectives and their sense of self, assigning subjectivity to their behaviours (Trevarthen, 2011). Through repetition, the value and function of communication is

learnt, and early skills are formed for more complex skill development within context (Bornstein & Bruner, 1989).

2.2.2 Social, Communication and Interaction Difficulties

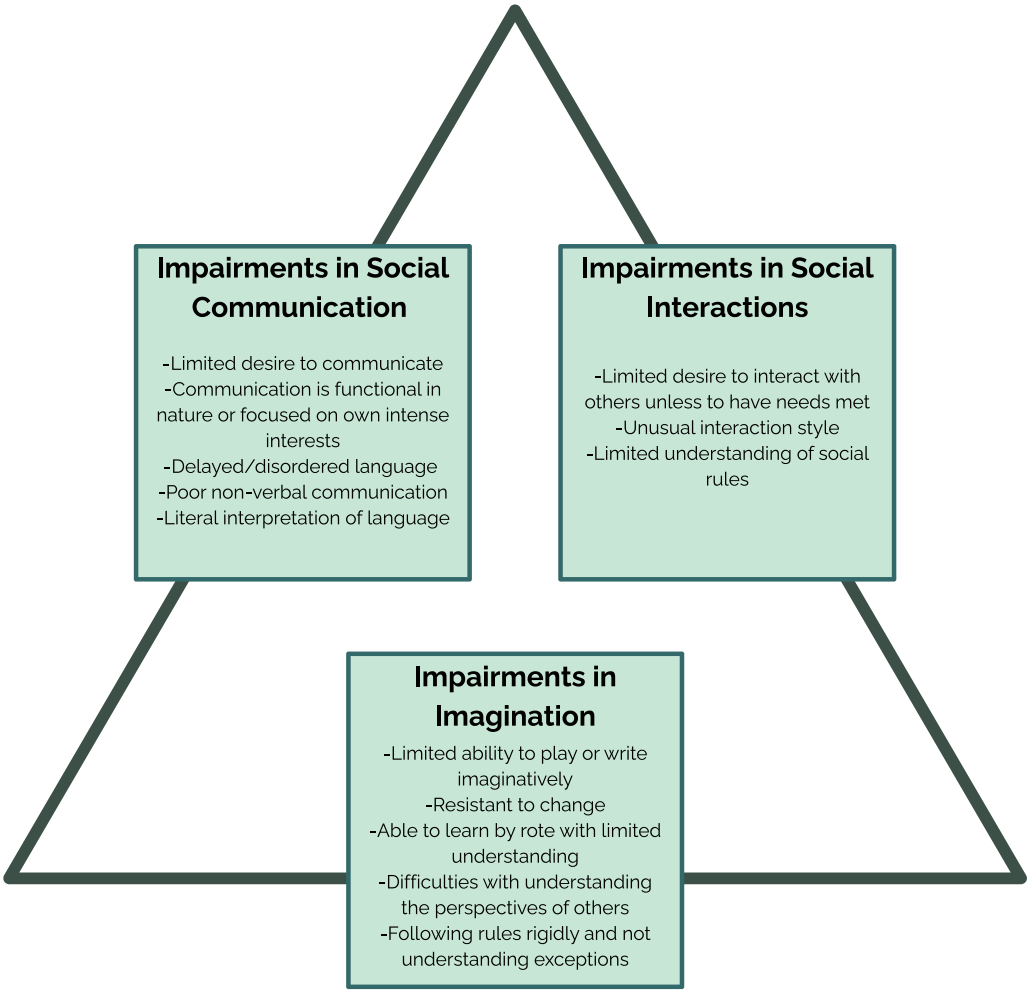
Typical development of communication skills may be impaired for those with additional needs, including SC&I difficulties. These are categorised by differences in verbal and non-verbal communication impacting an individual's ability to comprehend the meaning of others, in addition to social expectations (Norbury, 2014). These needs can impact information exchange and relationship development (NAS, 2023) and are influenced by a range of factors, including language disorders, Down's Syndrome and ADHD (Hawkins et al., 2016; Oxelgren et al., 2017).

2.2.2.1 Autism

One neurodiversity typically characterised by differences in SC&I skills, is autism (APA, 2013). Individuals with autism present with a Triad of Impairments in social communication, social interaction and social imagination, (Wing & Gould, 1979), outlined in Figure 2.

Figure 2

Triad of Impairments (Wing & Gould, 1979)



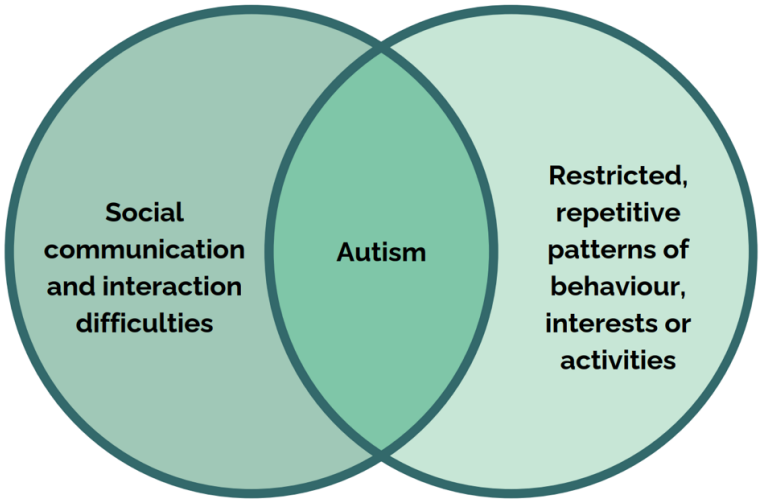
Note. Adapted from "*Investigating the Evidence Base of Social Stories,"* by S. Ali and N. Frederickson, 2006, *Educational Psychology in Practice*, *22*(4), pg. 356.

This framework was traditionally used in the diagnostic processes for autism and highlights the interaction between the three types of difficulties. However, the diagnostic criterion for autism within the DSM-5 has been revised and now also considers repetitive or stereotyped patterns of behaviour, interests and activities including sensory seeking behaviours or sensory sensitivities, such as vocal echolalia or stimming (APA, 2013). The Dyad of Impairments (APA, 2013), illustrated within Figure 3 highlights the interaction between social communication and interaction difficulties, in addition to the repetitive or stereotyped patterns of behaviour. It is

thought that with this revision, the DSM-5 supports the notion that autism is a spectrum of traits, rather than a fixed set of symptoms (APA, 2013).

Figure 3

The Dyad of Impairments (APA, 2013)



Whilst those with autism may share characteristics, they are individual in their interests, needs and preferences (Ambitious About Autism, 2022) and therefore have disparities in need. For example, approximately a third of autistic individuals have identified learning difficulties (NAS, 2023) and 70% have social, emotional and mental health needs associated with their diagnosis (Ambitious About Autism, 2022).

Autistic individuals often present with an impaired pattern of communication development, which can include differences in the use and understanding of verbal and non-verbal forms of communication (Mitchell et al., 2006). It is common for autistic individuals to exhibit delays in language development (Lord et al., 2020), with the most severely impacted presenting as non-verbal, estimated to be 30% of the autistic population (Ambitious About Autism, 2022). Toth et al., (2006) describe difficulties for autistic individuals in acquiring communication skills often observed in the infancy of typically developing children, including the use of gestures, vocalisations, facial expressions, eye gaze and joint attention skills (Trevarthen & Hubley, 1978;

Tomasello, 2008). These skills must be consolidated to develop subsequent communication and interaction skills (Hewett, 2007) and are the foundations for being able to effectively express needs (Adamson & Bakeman, 1985), engage in social exchanges and for some individuals, to develop speech content (Nind & Hewett, 2005).

Often individuals with autism are presumed to have an absence of sociability (Trevarthen & Delafield-Butt, 2013) and prefer periods of isolation (St. Clair et al., 2007). However, Jaswal and Akhtar (2019) postulate their interaction style is characteristically different, and they seek engagement and shared learning with others, through echolalia or stimming (Ephraim, 1998). Advancements in the field of neuroscience provide evidence supporting the presence of alternative non-verbal interaction behaviours for autistic individuals (Delafield-Butt et al., 2019) and differences in their use of early interaction behaviours compared to neurotypical children (Delafield-Butt & Trevarthen, 2017).

Several theorists argue these differences may impact the responsiveness of caregivers (Di Cesare et al., 2017), and over time, as foundations for shared meaning remain unestablished, these learners do not experience pseudo dialogues impairing subsequent communication skill development and the ability to develop their own subjectivity (Wootton, 2002; Anderson, 2004).

This highlights the joint responsibility of communication partners for initiating and maintaining successful interactions and therefore it is imperative to consider how those who are more skilled in communication can support those with difficulties.

2.3 Supporting Learners with Social, Communication and Interaction Needs

2.3.1 National Context of SEND

The NAS Education Report (2023) estimates there are over 180,000 autistic pupils in England, and the prevalence of need is further reflected in statistics around EHCP's. A third of EHCP's are for pupils who have a primary need of autism (Office of National Statistics, 2024a), and requests for Educational Health and Care Needs Assessments

(EHCNA) have increased substantially in recent years (Office for National Statistics, 2024b). For those with SC&I needs, such as autism, one possible explanation could be linked to an increased acceptance of neurodiversity, as a positive correlation has been found between public awareness and understanding of diversity and the number of individuals seeking autism diagnosis (Morris, 2024). However, considering the current context of SEND in the UK, these statistics may be underestimating the number of autistic students in education.

Several factors in the current context of SEND are likely to be negatively impacting the identification and therefore the outcomes for individuals with SC&I needs. This section aims to provide a broad overview; however, it is not an exhaustive list, and the author recognises the national context of SEND is complex and multifaceted, with many stating it is in crisis (Child of the North, 2024).

The SEND review (DfE, 2022) reports that the present system is failing to improve outcomes for CYP with additional needs and is financially unsustainable, due to increasing demand for SEND support and assessment in the UK (Office for National Statistics, 2024a). These factors may be contributing to delays within assessment processes (Child of the North, 2024), despite the importance placed upon early identification by the SEND CoP (DfE & DfH, 2015). Reportedly, individuals can be waiting up to 5 years for an autism assessment, as service capacity has not increased with demand (Jayanetti, 2022).

The SEND review (DfE, 2022) highlighted the impact of COVID-19 on delays in assessment and intervention, due to national lockdowns. Furthermore, many individuals would have spent limited time in education during the pandemic, impacting identification processes. Gascoigne and Gross (2017) note there is limited focus on SLCN after the age of five therefore, those in early education at the time of the pandemic, may have missed opportunities for early identification or support.

In addition to diminished capacity of services (Jayanetti, 2022), those working within health care professions may not recognise early signs of autistic behaviours (Filipek et al., 1999). This may reflect cautious optimism to avoid misdiagnosis, however, illustrates difficulties which families may experience in seeking an assessment of their

child's SEND (APPGA, 2017), in addition to the frustrations of navigating the SEND system, as highlighted in the SEND review (DfE, 2022). Furthermore, some caregivers may not actively seek assessment, which could be linked to anxieties regarding stigmatisation or blame when raising a child with SEND (Kinnear et al., 2016; DfE, 2022).

The SEND Improvement Plan (DfE, 2023) describes the current system of SEND support as a 'vicious cycle', as increased demand and insufficient funding, mean resources available are routinely utilised to support higher levels of need, or those with an EHCP, further impacting early identification and intervention. Therefore, pupils who need additional support, may not be receiving it due to the pressures of the SEND system and could be waiting for a needs assessment for support in school. This is likely to be pertinent for pupils in the infancy of their education, whose needs have not yet been identified (Ambitious About Autism, 2022).

Subsequently, the author will refer to the population as those with S,C&I needs for the remainder of the paper, in the hopes of being inclusive to those without a diagnosis, but would likely meet threshold, should their needs be assessed.

Since the publication of the SEND review paper (DfE, 2022), there has been a change in political leadership in the UK, which may impact the context of the education system. On review, it appears several education policies within the Labour manifesto, reflect the concerns of the SEND review paper, including aims to improve knowledge of those working with SEND learners, ensuring specialist settings can support children with complex needs, and aiming to improve the expertise and inclusivity of mainstream settings (Labour, 2024; DfE, 2022). To this end, funding has been invested to develop specialist Enhanced Resource Units within mainstream settings, in addition to creating more places within SEND schools (DfE, 2025), in the hopes of supporting children's educational success within their local community.

2.3.2 Supporting SC&I needs Within Educational Settings

One of the issues in supporting individuals with SEND, including those with SC&I needs, relates to how disabilities are currently viewed, often emphasising individual's deficits, as opposed to considering inaccessibility of the environment (Nind &

Cochrane, 2002). The SEND CoP specifies a CYP has SEND when *"he/she has a learning difficulty or disability which calls for special educational provision*" (DfE, 2015, p. 15), arguably a definition rooted within medical ideology (Bickenbach, 1993).

As specialist educational settings aim to meet needs of complex learners, which cannot typically be met within mainstream provision (Warnock & Norwich, 2010), it is debated that specialist settings maintain a sense of social exclusion for these individuals (Baker, 2007). Over time, this has led to the implication that inclusion is synonymous with participation in mainstream education (Ainscow et al., 2000). This reflects the social model of disability, which posits a person's difficulties are a result of the environment failing to adapt to their differences (Oliver, 1983; Mercer, 2023). Sitting alongside this model is the neurodiversity movement, which challenges the idea of 'deficits' and the expectation that neurodiverse individuals require 'fixing' (Chapman, 2019) instead, valuing neurodivergence as a natural part of human diversity (Singer, 1999).

Specific to SC&I needs, a focus should, therefore, be on removing barriers to SC&I needs in the classroom (Ainscow et al., 2000) and the perspective that successful communication is the responsibility of more than one individual (Anderson, 2004), taking account of neurodivergent perspectives when planning intervention methods (Nicolaidis, 2012). Critiques of this model postulate this stance may fail to recognise the significance of an individual's differences (Shakespeare & Watson, 2001), in addition to placing responsibility on schools and local services to support this cohort of learners (Bloom et al., 2020).

Ainscow at al., (2000) state that simply including learners with difficulties within a mainstream educational setting is not equivalent to inclusion, and many suggest 'inclusive' pedagogy often provided in mainstream settings can be exclusionary (Slee, 2011). True inclusion considers the learners individual needs and the provision most appropriate to meeting those needs (Ainscow et al., 2000). For children with SC&I needs, this considers accessibility to education, in addition to factors such as meaningful curricula and equality within peer groups (Child of the North, 2024).

This reiterates the importance of ensuring provision is carefully matched to individuals. Considering the national context of SEND and insufficient capacity within SEND settings (DfE, 2022), it is likely many learners are currently accessing a provision which is not best suited to their needs. Concerns around the education of students who would have historically attended specialist settings have long been debated (Nind & Cochrane, 2002) and more specific to SC&I needs, it is reported a high percentage of this population are accessing mainstream provision (NAS, 2023).

2.3.2.1 Teachers and Learning Support Assistants

Due to the prevalence and heterogeneity of learners with SC&I needs, it is imperative those working within education are well versed in communication skill development, the impact of difficulties in this area and appropriate intervention (Anderson, 2004).

Research has identified a significant pressure on educators to develop inclusive provision for those with SC&I needs, however with limited guidance or resources (Lindsay et al., 2013). A plethora of evidence highlights the reduced confidence and training for teachers in this area of SEND, with many reporting their teacher training included less than half of a day on autism (NAS, 2023). Additionally, many children with these needs are placed with support staff who may be untrained or have similar levels of knowledge (Jordan, 2008; Webster & Blatchford, 2014). This argument does not aim to blame on teaching staff, but to highlight the importance of opportunities for professional development to improve the outcomes for students with SC&I needs (Corkum et al., 2014).

2.3.2.2 The Role of Educational Psychologists (EP's)

EP's are well placed in supporting SC&I needs in schools due to their role in supporting SEND at an individual and systemic level (Fallon et al., 2010), providing a psychological perspective that support staff's understanding of the communicative intent of behaviours associated with SC&I needs. This is pertinent due to staff's limited understanding and confidence in supporting this population and the heterogeneity of the learners (NAS, 2023; Ambitious About Autism, 2022). It can therefore be concluded EP's make valuable contributions to supporting schools in implementing evidence-based interventions to support learners SC&I needs.

2.3.2.3 Evidence Based Interventions

To support the varied difficulties of individuals with SC&I needs in education, there are a range of evidence-based interventions on offer. Play interventions draw upon directive and non-directive techniques to teach a variety of skills, including those associated with social interaction (Thomas & Smith, 2004) and social communication (O'Keefe & McNally, 2021), within a natural context that fosters the development of social relationships (Gray, 2011). Learning through play is regarded as key to development during early childhood, specifically in terms of linguistic development (Bruner, 1983). Many play interventions draw upon Sociocultural Theory, which highlights the use of cultural tools such as language and the impact of social interaction using guided participation in activities to support development (Vygotsky, 1978; Woolfolk, 2019). Research has highlighted a positive corelation between play and the development of early communication skills including joint attention, joint engagement, body language and gestures (O'Keefe & McNally, 2021), which are often impaired or delayed for those with SC&I needs. This cohort of children often engage in repetitive play which may be isolated and have limited imagination (Thomas & Smith, 2004), which in addition to impacting their opportunities for development, likely reduces collaborative play with others and subsequently the development and maintenance of social relationships.

One intervention which aims to teach a repertoire of scripts to utilise in general play is Identiplay (Thomas & Smith, 2004). Developed from the work of Beyer and Gammeltoft (2000) on developing play structures using visualising, imitation, mirroring and turn-taking, Identiplay utilises two identical sets of toys, combining motor and verbal content, to teach functional play skills to children, so they may imitate play actions with their own toy set (Phillips & Beaven, 2007). Previous research evaluating this type of play intervention has found positive correlations between its use and the development of social play and play complexity, suggesting developments in play skills overall (Thomas & Smith, 2004; Allen, 2012). Learners require communication skills including the ability to maintain attention and the desire to interact with others, to be successful, as Thomas and Smith (2004) found autistic children at earlier stages of communication exhibited the fewest outcomes following an Identiplay intervention. This suggests it can be difficult to match learners with SC&I needs to the most appropriate intervention, due to population heterogeneity (Murza et al., 2015).

Taking a developmental perspective, many suggest non-verbal interaction skills which precede nuanced communication can be a useful focus for intervention (Anderson, 2004) and by developing early skills such as joint attention, this can support individuals in accessing higher order interventions later (Parsons et al., 2009). Attention Autism aims to improve joint attention and engagement in small groups, utilising stimuli which is visually appealing, kinaesthetic or auditory in nature (Attention Autism, n.d.) to motivate children to share attention and to communicate (Davies, 2013). Attention Autism is comprised of four stages which are built up sequentially as an individual's skills develop. Initially, the intervention aims to elicit brief joint attention, before working on maintenance, sustenance and attention shift (Moore, 2020). Studies evaluating the efficacy of this intervention have found that students' joint attention skills improved twofold, with some able to focus for up to 13 minutes (Courtman, 2018). Additionally, researchers observed significant development in communication skills during the study, along with reports of successful transfer of these skills to everyday situations (Kenny et al., 2025). As Attention Autism utilises four stages depending on the needs of the learner, this is notably more individualised than interventions such as Identiplay.

Despite this, and each of these interventions drawing upon Sociocultural Theory by emphasising the importance of learning through interactions with 'more knowledgeable others', they are each considered to be adult-directed and akin to typical teaching styles. Tomasello (2008) postulates the responsibility of achieving early joint attention skills is on the adult as a communication partner and found it was most improved when adults joined children focusing on an activity of their choosing. Considering the debates around inclusion (Ainscow et al., 2000) and the developmental understanding of intersubjectivity (Trevarthen & Aitken, 2001), perhaps it would be pertinent to take a neuro-affirming perspective and to utilise a child's strengths and interests to consider how initiate communication, despite presenting differently to others (Jaswal & Akhtar, 2019) and use this as a basis for development (Murdoch, 1997). An intervention which utilises the communication style of the learner is Intensive Interaction.

2.4 Intensive Interaction

2.4.1 What is Intensive Interaction?

Intensive Interaction is an approach which aims to support individuals at the early stages of development, with a particular focus on communication and interaction skills, including how to enjoy being with other people, to relate, interact and engage in communication routines (Hewett, 2023).

The approach was developed during the 1980's as a continuation of Ephraim's (1986) approach 'Augmented Mothering' which proposed using mother-child like interactions to teach communication and interaction skills to individuals with learning difficulties in a residential hospital. Although Intensive Interaction is linked to Augmented Mothering, it was renamed, as the latter was felt to undervalue the approach and practitioners raised concerns over 'infantilising' individuals whose chronological age may be significantly different, such as adults with additional needs (Caldwell 2006; Caldwell, 2013). In addition, it could be argued that the phraseology of 'Augmented Mothering', may perpetuate gender disparities as it assumes that caregiving is typically undertaken by women (Fraser, 2016). Ruddick's (1989) work in 'Maternal Thinking', aims to de-gender the concept by treating mothering as a discipline or verb, rather than a noun, challenging this social construct and reiterating that mothering is a practice for all who take on child caring responsibilities.

Like Ephraim's (1986) approach, Intensive Interaction aims to facilitate the development of social and communication abilities based on the natural pedagogy of the caregiver-infant relationship (Nind & Hewett, 2001). Its evidence base highlights this community of learners can include anyone who has not yet learnt the fundamentals of early social communication and within education, may include pupils with profound and multiple learning difficulties (PMLD) and those with autism (Nind & Hewett, 2005).

2.4.2 The Fundamentals of Communication

Nind and Hewett (1994) state Intensive Interaction provides an opportunity for learners to develop the Fundamentals of Communication (FoC). These fundamentals are based upon the skills acquired during infancy for typically developing learners (Hewett,

2007) and mirror the skills underpinning the communication pyramid and caregiver-infant interactions discussed in section 2.2.1. Initially, the fundamentals presented by Nind and Hewett (1994), focused primarily on communication and interaction skill development, see FOC1 within Table 1. Later iterations considered the importance of relationship and connection in supporting communicative development and aimed to reiterate the importance of emotional wellbeing for learners, see FoC2 within Table 1.

Table 1

The Fundamentals of Communication (Hewett, 2023)

Fundamentals Of Communication 1	**Fundamentals Of Communication 2**
Enjoying being with another person	Knowing that others care, learning to care
Developing ability to attend to that person	Enjoying being with another person
Concentration and attention span	Attachment/Attunement
Learning sequences of activity	Self-security
Taking turns in exchanges of behaviour	Self-esteem
Sharing personal space	Understand and identify own feelings and those of others
Learning to regulate and control arousal	Empathy
Using and understanding non-verbal communication	
Vocalising and using vocalisations (including speech) meaningfully	

Although Hewett himself critiqued the vagueness of the FoC2, they reiterate the philosophy of social learning and the psychological importance of connection, underpinning the approach (Hewett, 2012) linking to the pedagogy of caregiver-infant relationships, intersubjectivity and the development of self-awareness (Caldwell, 2006). The initial work of Ephraim (1982) described the relationship between emotional security and successful communication, suggesting this link was bidirectional and impacted by the responsiveness of communication partners. This highlights the association between the approach and Attachment Theory, which

describes an inherent biological response and behavioural system in place to satisfy basic human needs (Bowlby, 1969).

This leads us to consider the debate between the natural teaching opportunities which Intensive Interaction affords practitioners and the overarching aim to develop FoC in learners, in addition to the principles of Intensive Interaction itself, which emphasise the approach being ‘taskless’ in nature and focusing on interaction quality.

2.4.3 Approaches

During Intensive Interaction, the communication partner is guided by the behaviour and interests of the individual (Nind & Hewett, 2005) and responds with similar behaviours using vocal echoing; behavioural mirroring; engaging in joint focus activities (Nind & Hewett, 2001) and imitating body language to build up meaningful ‘conversations’ (Ephraim, 1986), like pseudo dialogues (Schaffer, 1984).

Evaluations of the approach have identified that practitioners often rely on ‘imitation’ which may limit the interaction to action-response (Barber, 2008), and lead others to perceive practitioners to be mocking those with additional needs through mimicry (Caldwell, 2006). Barber (2007) articulately reframes the idea of imitation to responding or extending, within what he refers to as “the tea party rules”, which ensures practitioners stay within the shape of the exchange and remain recognisable to the learner, whilst varying responses to create an environment for exploration.

Due to the idiosyncrasies of learners, their distinct communication style, and the style of the communication partner engaging with them, sessions are likely to look different for each pair. However, Hewett (2023) argues every session is guided by the principle of considering all behaviours as intentional communication and will share common features or techniques. These include using timed behaviours such as rhythms, repetitions and burst pause sequences to develop playful routines which ensure a mutually pleasurable interaction for both communication partners (Nind, 1999). Furthermore, each session requires the communication partner to tune in to the affective state of the learner and their behaviours, to ensure responses are meaningful (Caldwell, 2013). Attunement can support individuals feeling they have been met with empathy, alongside validating their behaviours and state of being (Siegal, 2020),

which is important for those communicating differently. Caldwell (2013) describes this as listening with all the senses to focus on a learners inner language, so their sensory monologue becomes a dialogue which can be shared, linked to intersubjectivity (Trevarthen & Aitken, 2001).

2.4.4 The Role of the Communication Partner

The role of the communication partner is imperative in Intensive Interaction as they must observe and reflect on the learner's behaviour before responding in a way which supports enjoyable social interaction and develops communication skills (Nind & Thomas, 2005; Barber, 2008). The main resource is the communication partner themselves and the way they use their face, body language and voice to encourage reciprocal patterns of interaction (Hewett, 2017; Mourière & Scott-Roberts, 2017).

The breakdown of communication between a learner with S,C&I needs and the communication partner is a shared responsibility, mimicking the perspective provided by the "double empathy problem" which highlights misunderstandings between autistic and non-autistic individuals (Milton, 2012). When communicating with individuals with SEND, it is important to consider power dynamics, therefore a key characteristic of Intensive Interaction is the communication partner's willingness to adapt their behaviours to be recognisable to the learner (Nind & Hewett, 2005). In this way, the communication development is scaffolded more similarly to academic learning (Bruner, 1983).

Nind (2000) reiterates the need for the adult to understand the theory and purpose to embed the approach as a whole philosophy. In addition to training, which can be accessed through the Intensive Interaction Institute (Mourière & Hewett, 2021), Donnelly et al., (2015) emphasises the importance of ongoing reflection for the success of Intensive Interaction.

2.4.5 A Curriculum or Inclusive Practice?

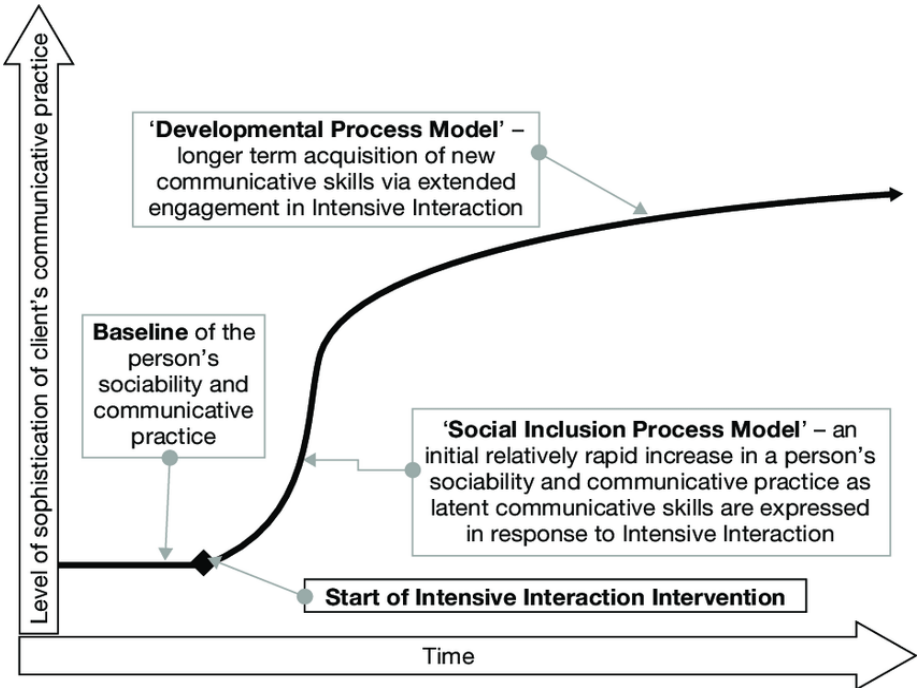
Improvements in social engagement have been found within minutes of utilising Intensive Interaction (Zeedyk et al., 2009), however some view it as an intervention to develop communication skills (Nind & Hewett, 2005), whereas others take the perspective of social inclusion (Caldwell, 2007).

This is complicated by the origins of the intervention in mother-infant pedagogy (Ephraim, 1986) and the principle of the intervention being process centric, placing less emphasis on goal related outcomes and more on interaction quality whereby everyone plays an active role, (Nind, 2000; Firth and Barber, 2011; Nind & Cochrane, 2001), supporting the notion of social inclusion. However, Nind and Hewett (2003) distinguish the approach from caregiver interactions by arguing it does not aim to recreate caregiver-infant relationships. Furthermore, they state that the techniques and structure utilised by communication partners provides access to a curriculum appropriate for the needs of these learners, evidenced by research illustrating positive outcomes, explained in section 2.5. Hewett (2007) describes this 'teaching' as being more artistic and flexible, as sessions are not planned or prescribed, and learners cocreate alongside communication partners.

Considering the variance of individuals which Intensive Interaction is appropriate for, perhaps this provides one explanation for differing views in its conceptualisation. For older individuals living within residential care settings, it may be more focused on being an inclusive practice, comparatively to use in education where developmental outcomes are prioritised (Firth, 2009; Nind, 2000). Firth (2009) suggests a dual aspect process model of Intensive Interaction, encompassing social inclusion and developmental progress, provided in Figure 4.

Figure 4

A Dual Aspect Process Model of Intensive Interaction (Firth, 2009)



By legitimising social behaviours, learners can become part of a community of social interactors and over joint and repeated experiences, the social activity develops sophistication and therefore developmental progression (Firth, 2009). Although this highlights the relationship between quality interactions and the process of Intensive Interaction on developmental outcomes (Nind, 2000), it perhaps minimises the influence of neuro-affirmative practice on its conceptualisation, and the 'Developmental Process Model' may therefore, be interpreted as a need to change or 'treat' a person's behaviours, in this case, their methods of communication (BPS, 2024).

2.5 Systematic Literature Review

2.5.1 Rationale and aims

Due to the varied nature of Intensive Interaction sessions and difficulties in measuring wide-ranging outcomes in this area, research has frequently used case studies or small sample sizes. Systematic literature reviews (SLRs) are a useful way of synthesising findings from this research methodology and aim to rigorously gather literature relevant to the current research question (RQ) (Gough & Thomas, 2016),

prioritising review transparency and the quality of the included studies (Chalmers, 2003).

Published SLRs on the subject of Intensive Interaction explore the perceptions of staff utilising the approach (Berridge & Hutchinson, 2021), the impact on individuals with profound and multiple intellectual disabilities (PMID) and/or autism (Hutchinson & Bodicoat, 2015) and more recently, a review aimed to explore the latest literature in using Intensive Interaction with children diagnosed with ASD (Papadopoulos et al., 2023). This paper excluded studies prior to 2015, due to their knowledge of the review conducted by Hutchinson and Bodicoat (2015).

The current review therefore aims to include all existing literature relevant to the current RQ, given in section 2.5.2, to synthesise a holistic understanding of research across the timespan which the intervention has been utilised and with a wider population, considering the likely context of undiagnosed SC&I needs. The current SLR aims to focus on participants who are within a UK school age population. As many of the existing reviews included a broad age range of participants, evaluating the use of Intensive Interaction in a variety of settings, conclusions are unlikely to be generalisable for a population of pupils with SC&I needs within education.

2.5.2 Research question

What are the outcomes of implementing an Intensive Interaction intervention with school aged children whose primary need is related to SC&I?

2.5.3 Method of Systematic Literature Review

2.5.3.1 Search Strategy

An initial scoping search highlighted limited research into Intensive Interaction; therefore, the search terms focused on the population and the phenomenon of interest. The search terms used in the databases are detailed in Table 2 and were based on the rationale of the current review, previous research in the topic and appropriate synonyms. Boolean operators and truncation were used during the search.

Table 2

Search Terms Used in Databases for Systematic Literature Review

Population Keywords		**Phenomenon of Interest Keywords**
ASC *OR* ASD *OR* Autis* *OR* Asperger* *OR* Social communication disorder *OR* Social communication difficulties *OR* Communication and Interaction *OR* Social Communication and Interaction Needs *OR* Social Communication and Interaction Difficulties	AND	Intensive Interaction *OR* Intensive interaction intervention *OR* Intensive-Interaction *OR* Imitative Interaction *OR* Augmented Mothering
Databases used for searches (on the 23rd of July 2024): ERIC PsychINFO Medline SCOPUS Web of Science		

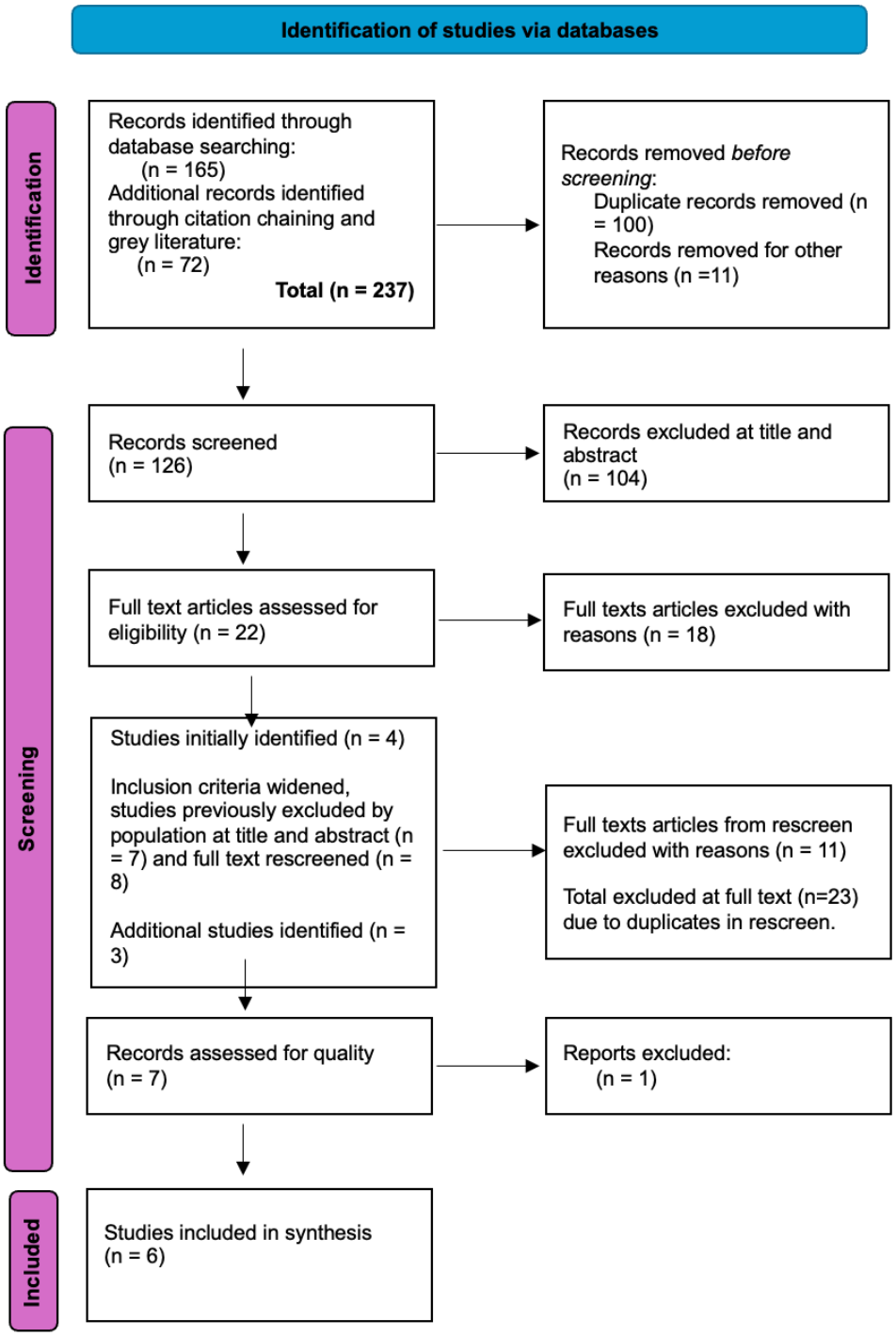
In addition to the databases highlighted above, a grey literature search was undertaken due to the limited peer-reviewed research available, using Google Scholar (on the 27th of July 2024). A citation chaining approach ensured studies from published SLRs (Berridge & Hutchinson, 2021; Hutchinson & Bodicoat 2015; Papadopoulos et al., 2023) were considered in the current review, in addition to citation chaining via the

Intensive Interaction website (https://www.intensiveinteraction.org/) and Connecting With Intensive Interaction website (https://connectingwithintensiveinteraction.com/), (accessed on the 27th of July 2024). A hand search checked for new literature using the same search terms in May 2025.

The search process is detailed in Figure 5. Results were initially screened by title and abstract, using the inclusion and exclusion criteria described in Table 3, before being accessed for eligibility at full text.

Figure 5

A PRISMA Flowchart to Demonstrate the SLR Search Process



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

During screening processes, due to limited results, a decision was made to widen inclusion criteria based on populations noted in initially excluded studies, discussed further in Table 3.

2.5.3.2 Inclusion and Exclusion Criteria

The studies were screened for eligibility based on the inclusion and exclusion criteria in Table 3. The rationale is provided alongside each criterion to ensure studies were relevant to the review question. See Appendix 1 for studies excluded at full text.

Table 3

Systematic Literature Review Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion	Rationale
A) Publication Type	Peer-reviewed journal articles and theses.	Existing literature reviews Other publications (e.g., book chapter, reviews).	Peer-reviewed journal articles were preferred to gather quality studies with higher reliability, particularly considering the decision to include multiple designs. Due to the limited research in this area and previous SLR's excluding grey literature, theses were included.
B) Study design	All	____	As research is limited, no methodology or design were excluded. Designs will be considered during quality appraisal (Gough, 2007).
C) Population	Intervention used with CYP within school/preschool age stipulated by the UK education system. Children must have identified SC&I needs, which may include, but not limited to a diagnosis of autism. Participants can be adults if the studies focus is on the	Interaction used with those over the age of 18 or under the age of 3. Children with a range of needs which may be interacting with SC&I, i.e., sensory impairments, physical difficulties or identified learning difficulties.	Research has found SC&I development can differ for populations with sensory impairment or physical needs, therefore these were excluded to ensure the focus remains on SC&I needs, although it is recognised many of the excluded population will experience these difficulties. Studies whereby adults have utilised the intervention with the population were included, as the scoping review highlighted studies focused on adults experiences. Due to the population needs, it is

	use of Intensive Interaction with CYP who meet the population criteria above and other inclusion/exclusion criteria.	*NB – broadened during the literature search to include learning difficulties alongside SC&I needs, due to the literature available and comorbidity of needs. Students with complex or PMLD continued to be excluded.	unlikely studies exploring their experiences in rich qualitative data (i.e., interviews) exist.
D) Phenomenon of Interest	Intensive Interaction or synonyms of Intensive Interaction as an intervention, including Imitative Interaction and Augmented Mothering.	Studies not using Intensive Interaction or similarly described approach.	Intervention named as Intensive Interaction was preferable. Due to the limited research available, all synonyms were considered and discussed at quality appraisal stage. The approach did not need to be used for a minimum period due to findings which indicated rapid impact (Zeedyk et al., 2009).
E) Context	Educational or home settings.	Social care settings.	Educational settings preferred due to the population focus and the researchers professional interest in supporting children within education. The scoping review discovered studies based in care homes and hospital settings with adults. By excluding social care settings, this supports population integrity identified in Criteria C.
F) Date published	Studies from the 1980's onwards.	Studies published before 1980.	Intensive Interaction was developed in the 1980's.
G) Language	Written in English.	Not written in English.	Studies had to be written in English for synthesis. Research conducted in other countries were included and considered at quality appraisal.

2.5.3.3 Data Extraction

Table 4 provides an overview of the seven studies identified for the review, prior to the quality appraisal process. See Appendix 2 for a detailed summary of each paper.

Table 4

Systematic Literature Review Preliminary Synthesis

Study	Design	Setting	Participants
Argyropoulou & Papoudi (2012)	Single Case Experimental Design (SCED)	Preschool, Greece	6-year-old male with autism
Bhogal (2022)	Qualitative, semi-structured interviews	SEND setting, UK	11 adult practitioners working with children aged 7-18 with autism and severe intellectual disabilities
Kellett (2000)	Multiple-baseline interrupted time-series	SEND school, UK	Pre-verbal 5-year-old male with severe cognitive delay and autistic presenting behaviours
Mourière & Hewett (2021)	Qualitative, case study	Home environment, country unknown	14-year-old male with PDD-NOS
Mourière & Scott-Roberts (2017)	Quantitative, action research	Home environment, UK	10-year-old male with autism
Sri-Amnauy (2017)	Qualitative, semi-structured interviews	Specialist and mainstream settings, Thailand	11 teachers working with preverbal students with autism and SLD
Tee & Reed (2017)	Quantitative, case-control study	SEND school, UK	40 males diagnosed with autism or PDD-NOS

2.5.3.4 Quality Appraisal

Studies were assessed for quality using a framework based on Gough's (2007) Weight of Evidence (WoE), across a range of domains, to evaluate the extent to

which each piece of evidence can contribute to answering the review question (Gough, 2007). See Table 5 below for scoring.

Weight of Evidence A: Quality of Methodology

This judgement is a generic and non-review specific assessment of the quality of the study based on methodology. Due to the broad range of studies included, the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018) was used. Papers were initially checked utilising screening questions to ensure studies were empirical and appropriate for quality assessment using the MMAT. Included studies were then appraised by rating criteria checklists associated to each study's methodology. These checklists were scored by dividing the number of criteria met to provide a percentage, whereby 0-33% scored 'low', 34-66% scored 'medium' and 67-100% scored 'high'. Each study scored as high, with 4 studies scoring 100% (Bhoghal, 2022; Mourière & Scott-Roberts, 2017; Kellett, 2000; Tee & Reed, 2017) and the remaining 3 studies scoring 80% (Argyropoulou & Papoudi, 2012; Mourière & Hewett, 2021; Sri-Amnauy, 2012). See Appendix 3 for details on the scoring and checklists used to appraise each study.

Weight of Evidence B: Relevance of Methodology

This judgement considers the relevance of the design and methodology of each study to the question: 'what are the outcomes of implementing an Intensive Interaction intervention with school aged children whose primary need is related to SC&I?'

To provide data that can be used to answer this RQ, in a relatively under researched area, the studies needed to use a research design that collected quantitative, qualitative or mixed methods data which contributed towards the evaluation of this approach. As this is a broad criterion, which did not impact the quality of any of the studies included, none were rated as 'low'. Gough (2007) argues by reviewing literature with a range of designs, there are issues regarding the relative extent the design of each study is fit for synthesis in a full or weighted form. All studies in the current review clearly highlighted outcomes in using Intensive Interaction, however one study (Sri-Amnauy, 2012) which briefly discusses outcomes, does so incidentally

and not as their paper's main focus, therefore this was rated as 'medium', whilst the other studies were rated as 'high'.

Weight of Evidence C: Relevance of Evidence to Review Question.

The studies selected were likely to have some relevance based on the inclusion and exclusion criteria stipulated during the search strategy (Gough, 2007), therefore no studies were rated as 'low'. Due to the limited research in this area, inclusion criteria had to be broadened, and this was considered during this aspect of quality appraisal. Studies were rated based on:

- Literature type: peer reviewed studies were preferable and rated as 'high'. Any grey literature was rated as 'medium'.
- Population: studies which focused purely on supporting children with SC&I needs, including but not limited to diagnoses of autism were rated as 'high'. Studies which included SC&I needs alongside other SEND were rated as 'medium'.
- Intervention: studies which named 'Intensive Interaction' were rated as 'high', studies which used synonyms, descriptions of similar approaches or used techniques based on Intensive Interaction were rated as 'medium'.
- Setting: studies undertaken within educational settings were rated as 'high' as those were preferable, any other environment, such as home settings, were rated as 'medium'.
- Country: as the researcher is based in and mainly concerned with the use of Intensive Interaction techniques in the UK, these studies were rated as 'high'. Studies from other countries were rated as 'medium'.

To calculate an overall rating for WoE C, combined ratings from the above criteria were utilised.

Weight of Evidence D: Overall Weight of Evidence

Combined judgements from A, B and C; evidence D is the overall WoE towards answering the review topic. Studies rated as high overall were included within the synthesis, comprising of 6 out of the 7 studies appraised for quality.

Table 5

Weight of Evidence

	Argyropoulou & Papoudi (2012)	**Bhogal (2022)**	**Kellett (2000)**	**Mourière & Hewett (2021)**	**Mourière & Scott-Roberts (2017)**	**Sri-Amnauy (2017)**	**Tee & Reed (2017)**
WoE A	**High**	**High**	**High**	**High**	**High**	**High**	**High**
WoE B	**High**	**High**	**High**	**High**	**High**	**Medium**	**High**
WoE C;							
Literature Type	High	Medium	High	High	High	Medium	High
Population	High	Medium	Medium	High	High	Medium	High
Intervention	Medium	Medium	High	High	High	High	High
Setting	High	High	High	Medium	Medium	High	High
Country	Medium	High	High	Medium	High	Medium	High
WoE C	**High**	**Medium**	**High**	**High**	**High**	**Medium**	**High**
Overall WoE D	***High***	***High***	***High***	***High***	***High***	***Medium***	***High***

Note: Table 5 provides an overall Weight of Evidence (WoE D) for each paper identified within the preliminary synthesis. This overall rating is made up of combined judgements from Weight of Evidence A, B and C which are related to the quality of methodology, relevance of methodology and the relevance of the evidence for the current research question respectively.

2.5.4 Synthesis of Findings

Due to the breadth of research designs and methodology within the current review, a narrative synthesis approach has been undertaken to summarise the literature.

2.5.4.1 Overview of Included Studies

Study Designs and Measures

Studies employed designs which used a range of data collection and analysis methods. Two studies used a qualitative design, utilising data from semi-structured interviews and consultation notes respectively. Bhogal (2022) conducted semi-structured interviews to gather teaching staff's perspective's using Intensive Interaction before using Reflexive Thematic Analysis to generate themes from the data, whereas Mourière and Hewett (2021) illustrated their case study using consultation notes, however, did not utilise a method of data analysis. The research referred to the FoC (Hewett, 2023), discussing the case study's baseline and anecdotal comments regarding progress, however, was not used as a form of measurement.

The remaining studies within this synthesis gathered quantitative data to illustrate their findings. One study (Tee & Reed, 2017) utilised data from published measures, two studies (Argyropoulou & Papoudi, 2012; Mourière & Scott-Roberts, 2017) used coded observations and research conducted by Kellett (2000) triangulated data using both methods. Studies utilising coded observations made use of video recording equipment and inter-rater reliability methods to improve accuracy and validity in their findings, and in addition, a qualitative case study (Mourière & Hewett, 2021), although reliant on consultation notes for data collection, utilised video clips within consultations.

Participants and Context

Most studies had a small or singular sample size, which may be due to the heterogeneity of the population, making the use of control groups or comparative research difficult to conduct.

Across the studies, there were a total of 55 participants, with 24 accessing Intensive Interaction, due to research utilising control groups (Tee & Reed, 2017) and a study

whereby teaching staff shared their perceptions on using the approach (Bhogal, 2022). The CYP who accessed the intervention, ranged from 5 to 18 years of age. One study did not specify the age range of participants, however noted the mean age as 9.90 years (Tee & Reed, 2017). As this study was conducted within a SEND setting in the UK, it can be presumed participants were within the age range of the inclusion criteria.

Not all studies provided participant characteristics regarding gender, however those that did, identified Intensive Interaction was used with male CYP. This reduces the generalisability of the outcomes from this specific review for female CYP and suggests more research could be done in this area. Additionally, the study which investigated adult perceptions of using the intervention (Bhogal, 2022), was conducted with all female teaching staff, impacting the generalisability of those findings.

Of the six studies included within this review, two reported the participants had diagnoses of autism (Argyropoulou & Papoudi, 2012; Mourière & Scott-Roberts, 2017), one reported the participant had a diagnosis of PDD-NOS (Mourière & Hewett, 2021) and one utilised participants diagnosed with either autism or PDD-NOS (Tee & Reed, 2017). PDD-NOS is Pervasive Developmental Disorder Not Otherwise Specified, and refers to behaviours related to autism, but were seen as not meeting the threshold. This is no longer recognised as a diagnosis and falls under the umbrella of autism (APA, 2013). Although one study (Bhogal, 2022) did not provide specific diagnoses of the participating children, it took place in a school for children with autism and severe intellectual disabilities and therefore although the extent of their SC&I needs are unknown, it is presumed to be prevalent. The participant in the final study (Kellett, 2000) had a severe cognitive delay, and autistic presenting behaviours. Descriptive information illustrated he was within the early stages of communication and interaction development

Four of the studies were conducted in the UK (Bhogal, 2022; Kellett, 2000; Mourière & Scott-Roberts, 2017; Tee & Reed, 2017) and one was conducted in Greece (Argyropoulou & Papoudi, 2012). The origin of the final study conducted by Mourière and Hewett (2021) is unknown, however based on the environment described, it is

unlikely to be the UK. Although language and dialect are unlikely to impact the implementation of Intensive Interaction, the context variation in this review reduces the generalisability of the findings due to differences in culture and educational curriculum.

Intervention Use

Although all studies in this review named Intensive Interaction within their titles, there appeared to be nuances in intervention delivery, which could be argued to be in line with the approach itself. Three papers (Bhogal, 2022; Argyropoulou & Papoudi, 2012; Tee & Reed, 2017) were explicit in noting intervention variance or stated techniques based on Intensive Interaction principles were utilised, which may impact the reliability of review findings. In addition, Bhogal (2022) noted as outcomes were not measured within their research and the intervention was not implemented as a curriculum per se, this contrasts the conceptualisation of the approach suggested by some theorists (Nind & Hewett, 2005). Conversely, the research conducted by Tee and Reed (2017) provided rich description of their intervention in which several principles were evidently synonymous with Intensive Interaction and practitioners were supervised by an experienced individual. This may suggest a closer adherence to 'true' Intensive Interaction than authors suggested.

The duration of intervention spanned from 2 to 38 weeks and ranged from 45 minutes across the week to 1-2 hours per day. The current review did not aim to explore the impact of intervention length on outcomes; however, this may have impacted the reliability of the outcomes in studies which used the intervention for shorter periods, considering the philosophy of the intervention and evidence which highlights the importance of repetition for communication skill development (Bornstein & Bruner, 1989; Nind, 1999; Firth, 2009).

Two studies (Bhogal, 2022; Kellett, 2000) used Intensive Interaction within a SEND setting, and one study (Argyropoulou & Papoudi, 2012) utilised it within a preschool, however as this study took place in Greece, this met the inclusion criteria for the review as the pupil was within UK school age. In these studies, the communication partners were teaching staff within the school environment. The other three studies (Mourière & Hewett, 2021; Mourière & Scott-Roberts, 2017; Tee & Reed, 2017)

utilised the intervention in home environments, however participants were enrolled at a specialist educational setting. The broad range of settings highlight the possibility of utilising the intervention in a variety of environments. Although three studies took place in home environments, only one (Mourière & Hewett, 2021) used the child's parents as communication partners within the intervention. The other two studies (Mourière & Scott-Roberts, 2017; Tee & Reed, 2017) used researchers, which, in addition to raising an issue of bias, could have impacted the results, due to the importance of relationship and connection underpinning Intensive Interaction (Hewett, 2023).

Differences were noted in the training and support that communication partners received. One study (Bhogal, 2022) stipulated adult participants must have previously had initial training from the Intensive Interaction Institute, however provided refresher training in Intensive Interaction principles. Tee and Reed, (2017) stated the researchers delivering the intervention had received three 60-minute sessions of Intensive Interaction instruction delivered by a supervisor, who had 7-8 years of experience. Lastly, one study (Mourière & Hewett, 2021) provided biweekly consultation sessions via remote video link from the Intensive Interaction institute. The other studies (Argyropoulou & Papoudi, 2012; Mourière & Scott-Roberts, 2017; Kellett, 2000) did not provide clear information regarding training or support, however, it is presumed training differed significantly across studies which impacts the reliability and generalisability of findings.

2.5.4.2 Synthesis of Results

The findings suggest a variety of outcomes when using Intensive Interaction with CYP with SC&I needs. Due to the breadth of outcomes, they were grouped into themes, with the researcher utilising elements of Thematic Analysis (Braun & Clarke, 2006) as a framework to organise findings. Final themes included communication, connection, emotional wellbeing, additional outcomes and "the importance of the other".

Communication

Four of the six studies discussed findings which link to early communication skills, or referenced the FoC (Hewett, 2023), highlighting improvements in vocalisation and non-verbal communication development, including increased physical contact, eye gaze and the use of gestures or facial expression to relay intentions (Kellett, 2000; Argyropoulou & Papoudi, 2012; Mourière & Scott-Roberts, 2017; Mourière & Hewett, 2021). Studies indicated improvements in attending to interactions, joint focus skills (Mouriere & Scott-Roberts, 2017; Kellett, 2000) and turn taking (Mourière & Hewett, 2021). Findings highlighted some evidence towards the development of more formal methods of communication including sign language (Kellett, 2000), new vocabulary and speaking in more complex sentences (Mourière & Hewett, 2021). CYP more interested in socialisation and more frequently initiated or accepted bids for interaction (Kellett, 2000; Argyropoulou & Papoudi, 2012; Mourière & Hewett, 2021).

Several studies referred to the opportunity Intensive Interaction provided CYP to practise communication skills through frequent repetition and rehearsal (Mourière & Scott-Roberts, 2017; Mourière & Hewett, 2021), with other studies noting regression when the intervention ceased (Kellett, 2000; Argyropoulou & Papoudi, 2021). This suggests the intervention is most effective over a longer period and when opportunities are frequent.

The results comment on the impact of Intensive Interaction on the interaction styles of others. This included an increased percentage of interaction bids made by peers, and more frequent positive responses during play (Argyropoulou & Papoudi, 2012). Key adults developed their understanding of participating CYP's communication styles, improving their ability to understand behaviour signals and meet pupils needs (Bhogal, 2022). This may indicate communication partners' increased acceptance of alternative communication methods, in addition to children developing awareness that communication can be intentional and reciprocal (Mourière & Scott-Roberts, 2017; Bhogal, 2022).

Connection

Many referred to Intensive Interaction as a way of developing the relationship between the child and their communication partner (Mourière & Scott-Roberts, 2017;

Bhogal, 2022), in addition to supporting the child's relationships with other members of their family and peers (Argyropoulou & Papoudi, 2012; Mourière & Hewett, 2021). One study highlighted the ongoing nature of this relationship and noted the intervention was most effective when used with familiar adults and became more significant over time, (Bhogal, 2022), reiterating a bidirectional link between relationships and intervention efficacy. Studies considered the trust and security these relationships afforded the children taking part in Intensive Interaction, and how these factors increased following Intensive Interaction (Mourière & Hewett, 2021; Bhogal, 2022). Communication partners delivering the intervention, referred to being 'in tune' with the children (Mourière & Scott-Roberts, 2017; Bhogal, 2022), highlighting the use of attunement, a key principle in Intensive Interaction.

Several studies illustrated children were spending increased time engaging with others, were more motivated to communicate and exhibited more frequent positive responses to interaction bids, compared to limited reciprocity prior to the intervention (Kellett, 2000; Mourière & Hewett, 2021; Argyropoulou & Papoudi, 2012). However, the study conducted by Bhogal (2022) highlighted differing views regarding children's desire to form connections or relationships, however, this may reflect adult's misunderstanding of attempts for social interaction (Jaswal & Akhtar, 2019).

Emotional Wellbeing

The current review highlights outcomes typically associated with social, emotional and mental health needs across all studies. Intensive Interaction's role in co-regulation and developing self-regulation over time was discussed (Bhogal, 2022), with studies noting individuals appeared 'calmer' (Mourière & Hewett, 2021) and showed improved emotional engagement (Argyropoulou & Papoudi, 2012). This may have had an impact on the effectiveness of the intervention, as it was noted students seemed more accepting of interaction bids (Argyropoulou & Papoudi, 2012; Mourière & Scott-Roberts, 2017) and appeared more comfortable with communicative approaches such as physical contact (Kellett, 2000) following the intervention.

There was a correlation made between this theme and the theme of connection. Studies commented on the impact of using Intensive Interaction to build genuine relationships based on trust, safety and security (Bhogal, 2022) and the increased

emotional intimacy observed between a set of peers (Argyropoulou & Papoudi, 2012). The latter was exemplified during the withdrawal phase of an A-B-A SCED, whereby the student engaged in less social initiation attempts however, their responses to a peer's bids for interaction remained positive, suggesting a relationship had developed during Intensive Interaction and remained once the intervention had ceased. Additionally, the findings from this review highlighted anecdotal evidence regarding increased motivation and enjoyment in communicating with others (Kellett, 2000; Argyropoulou & Papoudi, 2012; Mourière & Hewett, 2021).

Although not the intended objective of Intensive Interaction, repetitive behaviours and echolalia reduced (Mourière & Hewett, 2021) and a non-significant, but numerical decrease in problem behaviour scores was identified (Tee & Reed, 2017). This may suggest Intensive Interaction has a positive impact upon challenging behaviours, however, the specifics of these behaviours were not identified within the papers and should be interpreted with caution. Participants interviewed by Bhogal (2022) hypothesised outcomes related to increased wellbeing may be linked to students having increased autonomy and therefore control within interactions, reducing anxiety, a difficulty typically associated with SC&I needs (Ambitious About Autism, 2022). Several findings indicated a positive impact of the intervention on CYP's self-esteem, referring to increased assertiveness, confidence (Mourière & Hewett, 2021) and achievement when experiencing successful interactions using their unique communication style (Bhogal, 2022).

Additional Outcomes

Findings suggested Intensive Interaction may have had positive impacts on other children, not necessarily targeted by the intervention, signified by improved social behaviours and enjoying a role within sessions (Argyropoulou & Papoudi, 2012). For participating children, improvements continued following the intervention or were generalised to different contexts (Mourière & Scott-Roberts, 2017). One study noted positive impacts on skills associated with academics including attainment, concentration and engagement with schoolwork and the development of literacy skills (Mourière & Hewett, 2021) and another, noted Intensive Interaction supported the assessment and identification of appropriate next steps of learning (Bhogal, 2022). These findings may provide further evidence for the breadth of outcomes

associated with Intensive Interaction, however as much of above has been summarised from anecdotal evidence, this has not been empirically evaluated and may warrant further exploration in future research.

"The Importance of the Other"

Although the current review did not aim to investigate factors which impact the effectiveness of Intensive Interaction for children with communication needs, a common theme considered how the communication partners role may impact the efficacy of the intervention. As previously discussed, several studies highlighted the importance of the communication partners attuning to CYP, and building relationships with them (Mourière & Hewett, 2021; Mourière & Scott-Roberts, 2017).

Findings suggest Intensive Interaction provided a useful framework and range of approaches for communication partners to use within a heterogenous population and supported their recognition of alternative behaviours as intentional communication (Bhogal, 2022). A variety of methods appeared to support communication partners skill development, including reflective logs (Argyropoulou & Papoudi, 2012; Kellett, 2000), peer supervision evaluating video recordings (Mourière & Hewett, 2021), and self-reflection of recordings (Mourière & Scott-Roberts, 2017; Kellett, 2000; Argyropoulou & Papoudi, 2012). In addition to the importance of practitioners accessing effective training to understand the principles underpinning Intensive Interaction, these methods also highlight the importance of reflective practice, to ensure the approach is individualised to each learner.

Bhogal (2022) identified teaching staff's concerns around whether they were best placed to deliver this intervention, as engaging in child-led activities was at dissonance with their roles as teachers who should be instructing children. Conversely, others within the same study felt promoting emotional wellbeing and meeting children's needs was their primary role and effective learning was unlikely to take place without meeting these needs first.

When Intensive Interaction sessions were interrupted, for example due to school holidays, studies noted differences in outcomes. For studies taking place in schools, this raised the question of how the intervention could be extended to home settings,

whilst weighing up the practical logistics of doing so and highlighting the importance of opportunities to be trained in Intensive Interaction (Kellett, 2000; Tee & Reed, 2017).

Across the reviewed literature, barriers were identified which may impact implementation. This included differences in the conceptual understanding of the approach (Mourière & Hewett, 2021; Tee & Reed, 2017), the impact of temporal factors such as school holidays (Kellet, 2000) and the general pressures of teaching impacting the communication partner's ability to get to know the child (Bhogal, 2022), which has clear links to the principle of Intensive Interaction being child-led, referred within some of the studies in this review (Mourière & Hewett, 2021; Bhogal, 2022). Some studies discussed the importance of considering the individuality of the children's needs within the intervention (Bhogal, 2022) and others suggested the specificity of the child's needs could predict the intervention's efficacy (Tee & Reed, 2017).

2.5.5 Limitations

This synthesis has several limitations. Due to limited literature in this topic, the review included studies utilising broad methodological designs, in addition to reviewing grey literature which is unlikely to have been subject to rigorous peer-review processes, which may impact the quality of the research and subsequently, its findings. Despite being inclusive in terms of design, it is a small-scale review, consisting of a limited number of studies with few participants, spanning the globe, impacting the generalisability of the findings.

Although most of the included studies used a quantitative method, not all the studies employed standardised measures of assessment nor methods of statistical analysis. In addition, one of the qualitative studies did not appear to utilise a method of data analysis. Due to this, and to add depth to the data synthesised in the current review, anecdotal comments from the papers were included within the findings. Although this has arguably captured the nuance of the approach and outcomes across the literature, this raises questions in terms of the reliability of the synthesis.

The review further highlighted a broad conceptual understanding of Intensive Interaction, despite commonalities in techniques and an overarching aim to improve communication and interaction skills. Most of the children accessing the intervention within the current review had a diagnosis of autism, which although is a diagnosis primarily associated with SC&I needs, it could be argued the heterogeneity of this population is so significant, the synthesis of evidence is unlikely to be generalisable to the whole population. Additionally, due to the limited research, the inclusion criteria needed to be widened to include moderate and severe learning difficulties, which may have influenced the reliability of the findings. The study excluded several papers which referred to the use of Intensive Interaction with individuals with complex or PMLD to focus the literature on SC&I needs alone, however the researcher recognises valuable studies may have therefore, been missed.

The quality appraisal process utilised a weight of evidence approach, (Gough, 2007) which reviewed several factors including the method specific to the current review question, the focus and context specific to the current review question and a generic appraisal of the quality of the method. For this aspect of the quality appraisal, the MMAT (Hong et al., 2018) was chosen. Considering the variety of methodological design, using different or additional quality appraisal tools to investigate the rigour of study design may have provided an alternative result. Inter-rater checks were not utilised throughout the review, therefore, despite efforts to remain objective, the researcher recognises the risk of subjectivity which may have impacted the overall findings.

2.5.6 Conclusions

This synthesis of literature highlights a range of positive outcomes in using Intensive Interaction with children with SC&I needs. Although research varied in terms of methodology and intervention use, the conclusions drawn suggest an increase in interaction opportunities and positive effects in early communication skill development. The review highlights important emotional elements which may have impacted the success of the intervention including participants developing relationships with others and enjoying socialisation. It is likely these outcomes may have links to the differences in emotional regulation described, in addition to increased self-esteem. Although this synthesis aimed to summarise the outcomes of

using Intensive Interaction for those with SC&I needs, a key theme was the role of the communication partner, whose reflective facilitation is likely to have supported skill development. The wider impact this intervention may have for other individuals in attendance in education settings is highlighted, illustrating the possibility of the intervention as an inclusive approach for all.

2.6 Introduction to Current Study

It is evident that further research into the use of Intensive Interaction would add to the limited existing literature, and it is hoped that in doing so, this will raise the awareness, knowledge and confidence of those working within education supporting children with SC&I needs. This is particularly important in the current context of SEND support within the UK, where pupils with additional needs are more frequently being educated within the mainstream classroom. There is minimal research into the use of Intensive Interaction within a mainstream provision, and furthermore, as a previous SLR has discussed the need to investigate perceptions of a more homogenous group of staff delivering the intervention, (Berridge & Hutchinson, 2021) this could provide that opportunity. Research has consistently highlighted the importance of the adult's role within Intensive Interaction, therefore by gathering data focused on their experiences, this is likely to add context to measurable outcomes of using Intensive Interaction within a mainstream classroom. The current study, therefore, takes place across 5 mainstream primary schools and evaluates the use of Intensive Interaction for 5 pairs of participants, made up of a child with SC&I difficulties and a key adult supporting them within the school setting.

2.6.1 Research Questions

The aim of the proposed research is to evaluate the use of Intensive Interaction in supporting children with SC&I difficulties attending mainstream primary schools, addressing the following RQ's.

1) What are the outcomes of using Intensive Interaction on early communication skills?
2) What are teaching staff's experiences of using Intensive Interaction with young people in mainstream schools?
3) What factors are perceived to support and hinder the implementation of Intensive Interaction in mainstream schools?

3. Methodology

3.1 Introduction to Chapter

This chapter initially describes the theoretical paradigms influencing research design and the specific impact this has had on the current study. The mixed methods design and sampling methods are then discussed, before considering data collection and analysis methods utilised in each phase. Threats to validity and reliability are considered alongside mitigating actions.

3.2 Theoretical Paradigms and Philosophical Assumptions

3.2.1 Paradigms

Paradigms guide decision making and actions in research (Mertens, 2005) and are defined by the beliefs of the researcher, including their philosophical assumptions about reality and the nature of knowledge (Mertens & McLaughlin, 2004).

Based on this definition, there are understandably conflicts between paradigmatic beliefs, values and assumptions within the research community (Braun & Clarke, 2014), and psychological research is often criticised in its attempts to balance scientific rigour with relevance in context (Boyle & Lauchlan, 2009; Schön, 1987).

Researchers must identify which paradigm most closely approximates their worldview, and can be guided by the following:

- Ontology: What is the nature of reality?
- Epistemology: What is the nature of knowledge and the relationship between the knower and the would-be known?
- Methodology: How can the knower go about obtaining the desired knowledge and understanding?

(Mertens, 2015, p. 10)

Table 6 illustrates how these basic beliefs relate to the three main paradigms. The following sections aim to provide an overview of these philosophical assumptions in research.

Table 6

Major Paradigms Used in Educational and Psychological Research

	Post-positivism	**Constructivism**	**Pragmatism**
Ontology	There is one true reality, however knowledge of this is imperfect and within a degree of probability	There is no one objective reality, realities are multiple and socially constructed	Presumes a single reality exists, however individuals interpret that reality uniquely
Epistemology	Researcher strives to maintain objectivity by controlling biases	Knowledge is co-constructed between the researcher and participants. Values are made explicit	Relationships are defined based on what the researcher finds appropriate to the study context
Methodology	Primarily quantitative	Primarily qualitative	Methods should match the research purpose and RQ's. Quantitative, qualitative and mixed methods can be used

Note: Adapted from Mertens, 2015

3.2.2 Post-positivism

Post-positivism is derived from the positivist paradigm, which suggests the purpose of research is to develop confidence or prove a single theory is true (Gall, Gall & Borg, 2002), aiming to find a causal link between variables, using scientific approaches (Robson & McCartan, 2016). Therefore, the ontological and epistemology standpoint is that there is a single reality which can be measured by testing a hypothesis (Atkinson & Hammersley, 1998), utilising quantitative measures of data and taking an objective stance (Robson & McCartan, 2016).

It could be argued this degree of control is unfeasible in real-world research (Phillips & Burbules, 2000), and furthermore, the paradigm is criticised for reducing human nature to simple variables (Schrag, 1992). By removing subjectivity from the development of knowledge, this limits the researchers reflexivity and diminishes the importance of context on real-world research, in the development of evidence-based interventions (Moore, 2005; Mertens & McLaughlin, 2004).

Therefore, the post-positivist paradigm (Teddlie & Tashakkori, 2009), acknowledges the impact the researcher's perspectives may have on conducting research (Reichardt & Rallis, 1994), however unbiased they aim to be. Whilst the epistemological focus remains to be objective, as in positivist research, the ontology is more constructivist in nature, (Robson & McCartan, 2016). Criticisms of post-positivism argue these are conflicting principles (Moore, 2005), however, by acknowledging the influence of thoughts, feelings and unobservable phenomena, post-positivism states researchers can only claim to know the truth imperfectly (Mertens, 2005).

3.2.3 Constructivism

A paradigm described to directly oppose positivism is the constructivist paradigm, which states that reality is created via social construction (Guba & Lincoln, 1989). The relativist ontological perspective suggests an individual's reality is defined by their subjective experiences (Robson & McCarten, 2016), highlighting many realities, over the positivist view of a singular truth (Robson, 2011). Epistemologically, researchers take an active role in co-constructing knowledge with participants (Mertens & McLaughlin, 2004), often using qualitative methods such as interviews to collect rich data (Schwandt, 2000; Robson & McCartan, 2016; Teddlie & Tashakkori, 2009).

Due to the individualised nature of reality central to the constructivist philosophy, it is argued research undertaken in this paradigm has limited generalisability (Creswell, 2015), and findings may only be useful in the real world should the context match the research exactly (Schrag, 1992). Critics also highlight issues relating to scientific rigour, noting the methodology is less reliable and valid compared to approaches typically associated with the positivist/post-positivist paradigm (Robson & McCartan, 2016).

3.2.4 Pragmatism

Pragmatism focuses on 'what works' in practice (Creswell & Plano Clark, 2007), and research in this paradigm focuses on the current RQ, rather than a specific worldview (Mertens & McLaughlin, 2004). This approach aims to draw upon strengths of the post-positivist and constructivist paradigms (Johnson & Onwuegbuzie, 2004), often

utilising mixed methodology to test hypotheses whilst considering the contextual complexity of human nature (Tashakkori & Teddlie, 2003).

However, the incompatibility thesis posits the paradigms underpinning each method are, incompatible (Howe, 1988) therefore, mixed methods research is often questioned from political, technical and philosophical standpoints (Hathcoat & Meixner, 2015).

From a political perspective, there is an historical debate around the nature of evidence-based research, with many preferring measurable data over that which is socially constructed. When conducting research within a social setting, such as education, there is an argument for the collaboration of the two to address questions from diverse perspectives and develop a comprehensive understanding of educational issues (Howe, 2009).

Critics debate the appropriateness of mixed methodology and maintain that qualitative and quantitative methods are incompatible (Hanson et al., 2005). It is claimed mixed methods research is frequently biased towards either a quantitative or qualitative stance, depending on the method of collecting, analysing and reporting on the data. The view that all research has a qualitative grounding provides a succinct counterargument which emphases the importance of context and interpretation of results even in post-positivist research, therefore, it is suggested that methods overlap more significantly than once thought (Howe, 1988).

Those in favour of the incompatibility thesis state that paradigms influence methods unilaterally, however, Howe (2003) reasons this is more nuanced and the relationship between research methods and epistemology requires mutual adjustment. Furthermore, as pragmatism is less focused on epistemological and ontological principles, presenting the nature of truth as a fluid concept focusing on solving the current problem (Robson & McCartan, 2016), this encourages researchers to consider not whether the approaches can be combined, but how it can be successfully accomplished (Howe, 1988).

In summary, the flexibility of combining designs can add weight to answering RQ's, such as using a quantitative approach to measure intervention efficacy, with qualitative data providing context such as why, for whom and how (Greene, 2007). By drawing from varied epistemological and methodological assumptions, Maxcy (2003) posits taking a pragmatic approach equates to more functional knowledge which considers the impact research has on daily practice.

3.2.6 Stance of the Current Research

The current research is situated within a pragmatic paradigm, as the methodological approach seeks to answer the proposed RQ's (Teddlie & Tashakkori, 2009) and values both objective and subjective knowledge (Johnson & Onwuegbuzie, 2004). As a mixed methods design is utilised (discussed in section 3.3), it is pertinent to understand the paradigms which underpin each phase of the research, with consideration to the data collection and analysis methods in each strand.

By taking a pragmatic stance, the intention is to evaluate Intensive Interaction and establish cause-effect relationships in a 'real-world' context (Robson, 2011). Phase 1 takes a post-positivist lens and utilises measurable outcomes to objectively evaluate the impact of Intensive Interaction on children with SC&I needs in mainstream schools, recognising the knowledge is likely to be imperfect. The qualitative aspect of the study in phase 2 aims to provide insight into this phenomenon by exploring the individual experiences of those taking part. Although these perspectives are somewhat at odds with one another, (discussed in section 3.2.4) Johnson and Onwuegbuzie (2004) state as knowledge is constructed and based on an external reality, taking a pragmatic approach allows multiple realities to be explored empirically.

3.3 Mixed Methods

Mixed methods is defined as *"research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry"* (by Tashakkori & Creswell, 2009 p.4), allowing a fusion of fixed and flexible methodological approaches.

It is said RQ's should guide methodological decisions (Klingner & Boardman, 2011), and historically, researchers chose between quantitative or qualitative methods and data (Robson, 2011; Creswell, 2003). However, researchers often have multiple RQ's to effectively investigate a phenomenon, necessitating the need for mixed methods (Mertens, 2015).

Mixed methods are often utilised in educational and social psychology research (Armstrong, 2014), which may be due to the need to provide evidence-based interventions within these settings. Gorard (2010) suggests using a variety of data collection methods can be effective in exploring the outcomes of an intervention, in addition to the context in which it was implemented.

Furthermore, triangulation of quantitative and qualitative data provides stronger inference than using either type of data alone (Bryman, 2006), through seeking a common understanding, or exploring the phenomena from alternative perspectives (Mertens, 2015). It may compensate for the limitations identified in either method (Creswell & Plano Clark, 2007), however it is argued researchers then need to be experts in both approaches (Mertens, 2015).

Various mixed methods approaches can be used in research studies. The method design varies based on the order of data collection, data prioritisation, and data mixing (Creswell & Plano Clark, 2007) and are outlined in Table 7.

Table 7

Mixed Methods Designs

Design type	Data collection method
Sequential explanatory	Collection and analysis of quantitative data, followed by collection and analysis of qualitative data. Quantitative data is prioritised. Qualitative data supports and explains quantitative findings.
Sequential exploratory	Collection and analysis of qualitative data, followed by collection and analysis of quantitative data. Qualitative data is prioritised. Typically used to explore an under researched phenomenon.
Sequential transformative	Priority can be given to either method, therefore either can precede the other, however they are undertaken sequentially. Guided by a theoretical perspective e.g., conceptual frameworks.
Concurrent triangulation	Qualitative and quantitative methods are used in parallel and separately to one another.
Concurrent nested	A secondary method is embedded within a primary method which can be either quantitative or qualitative.
Concurrent transformative	Methods are undertaken in parallel. Guided using a theoretical perspective e.g., conceptual frameworks.

Note: Adapted from Robson & McCarten, (2016)

3.3.1 Using Mixed Methods in the Current Study

A mixed methods approach was utilised to make use of quantitative and qualitative methodology, to answer various RQ's in a singular study (Mertens, 2015). A sequential explanatory design was chosen (Robson & McCartan, 2016) whereby the qualitative data aimed to complement quantitative findings, explaining numerical results by gathering participants perceptions of the intervention (Tashakkori & Teddlie, 1998), illustrated in Figure 6.

During phase 1, a Single Case Experimental Design (SCED) was used to explore the impact of Intensive Interaction on the early interaction skills of individual students with SC&I difficulties.

In phase 2, semi-structured interviews were undertaken with the child's key adults to explore the experiences of implementing the intervention and any additional outcomes not measured within the SCED.

Figure 6

An Illustration of the Current Study's Design

3.4 Piloting

A pilot study was undertaken to test the feasibility of the planned procedure and to evaluate the measures and training methods (discussed in section 3.6) on a smaller scale (Robson & McCartan, 2016). As quantitative measures were developed as part of this research (discussed in section 3.6.1.3), the pilot provided an opportunity to test the measures and ensure they provided meaningful data for the RQ's, in addition to exploring any administrative difficulties as they arise (Mertens, 2015), pertinent due to the procedure of key adults recording and collecting data themselves. The pilot also provided an opportunity for the researcher to explore the semi-structured interview questions to ensure the qualitative data was meaningful. During the interview, the researcher asked questions relating to the procedure.

The pilot included a student in key stage 1, attending a mainstream school, with SC&I needs and his key adult. Participants were recruited opportunistically via EP casework within the EPS. Consent was sought from participants and caregivers as appropriate, and the pilot adhered to the ethical considerations within the main research study. The pilot spanned three weeks, whereby the participants used Intensive Interaction daily and were asked to complete measures twice weekly.

Feedback was taken from the pilot, and amendments were made where needed (see Appendix 4).

3.5 Sampling

3.5.1 Recruitment

A purposive sampling strategy was utilised, to recruit pairs of participants from mainstream schools supported by the Educational Psychology Service (EPS). Pairs were made up of a student within Reception or Key Stage 1 (KS1) with SC&I needs and a key adult, i.e., a teaching assistant (TA) or one-to-one staff member who supports them daily. Within the current study, a formal diagnosis of Autism or SC&I needs was not required. Child participants were required to be at the early stages of communication development such as showing limited interest in interactions with others and primarily be at a pre-verbal stage of communication. Children who were frequently interested in and seeking out interactions or often engaging in joint attention activities were excluded from the study. For full inclusion/exclusion see Appendix 5.

Participants were recruited opportunistically, through two means:

1. Recruited through EP casework, conducted by colleagues within the EPS where Intensive Interaction had been recommended. Schools were emailed (Appendix 6) to ask if they would be interested in participating alongside the recruitment poster (Appendix 7) and inclusion/exclusion criteria (Appendix 5).
2. Part of the rationale for the research related to anecdotal evidence that Special Educational Need Co-ordinators (SENCo's) frequently sought EP support for unidentified SC&I needs in EYFS. Therefore, the author recognised appropriate children may be beginning their school career at the outset of the research (September 2024) and not attending at the time of recruitment (Summer 2024). EPs within the EPS were briefed so they could signpost SENCo's to the project should appropriate participants arise during planning meetings. In addition, all mainstream primary schools supported by the EPS were made aware of the research via email (Appendix 8) and asked to contact the researcher if they were interested and had a pair of participants who met the criteria. Places were allocated based on response times.

Online meetings were undertaken with the 8 schools initially recruited to ensure the proposed procedure was understood. 2 schools were unable to commit to the research. These places were offered to the settings who had responded next, and the same procedure was repeated.

At this point, written permission was sought from the school's Senior Leadership Team (SLT). Information sheets and consent forms (Appendices 9 & 10) were provided to the caregivers of the child participants, alongside an offer to meet and discuss the study in more detail. This was not requested by any caregivers. Information sheets were provided to key adults participants in the setting (Appendix 11), with consent forms (Appendix 12). As the research had largely been organised with school SENCo's, informed consent was gathered from these participants and checked at each stage of the research to ensure they did not feel obligated to participate.

Participant characteristics were gathered, providing an opportunity to ensure participants met inclusion criteria. 2 sets of participants were excluded at this point as their SC&I skills appeared more advanced than initially reported. A further set of participants were excluded during baseline fidelity checks (section 3.6.4) for the same reason. Data of the excluded participants was destroyed, and an ethical procedure of providing alternative intervention training was offered (e.g., Attention Autism and/or Identiplay) to support next steps of development.

3.5.2 Participant Characteristics

5 pairs of participants took part in the research, across 5 educational settings in the county in which the EPS was based. Table 8 and Table 9 detail participant characteristics. For a pen portrait on each participant, see Appendix 13.

Table 8

Overview of Child Participant Characteristics

School	Pseudonym	Age (Years.Months) Year group	Gender	Diagnosis/ Support	SC&I Development	Emotional regulation
1	Charlie	4.2 Reception	Male	No diagnosis. School gathering evidence for EHCNA.	Does not interact with others. Will move away if interaction is attempted. Occasionally accepts comfort. Often makes noises, grunts or babbles to himself.	Emotionally dysregulated, frequently screams, hits or bites.
2	Stephen	5.3 Year 1	Male	Autistic. EHCP 32.5 hours.	Limited language use. Uses singular words inconsistently. Typically uses echolalia or sounds.	Withdraws or engages in “tantrum” behaviours - throwing himself on the floor or spitting.
3	Jackson	5.2 Year 1, educated in EYFS	Male	Autistic. EHCP 32.5 hours.	Communicates through noises, uses odd word inconsistently. Interacts to get needs met. Does not interact with peers.	Frequently dysregulated, often screams and cries. Sensory sensitivities.
4	Joshua	4.4 Reception	Male	Autistic. EHCP 32.5 hours.	Uses sounds. Interactions with primarily functional in nature. Not interested in peers.	Extremely dysregulated and overstimulated. Often screams, headbangs, bites

					Follows own interests. Better receptive language skills.	himself/others. Sensitive to noise.
5	Levi	4.11 Reception	Male	Autistic. EHCP 32.5 hours.	Uses echolalia and babbling. Interactions primarily functional in nature. Often leaves interactions. Prefers to follow own interests. Little interest in peers.	Very dysregulated at the start of the year and flighty. Somewhat withdrawn.

Table 9

Overview of Adult Participant Characteristics

School	Pseudonym	Gender	Role	Time working with child	Relevant experience
1	Chloe	Female	TA	3 weeks	Experience with range of SEND, including autism.
2	Anne-Marie	Female	1-2-1	3 weeks	Experience with autistic children and children with challenging behaviours. No experience working with pre-verbal children. Personal experience of supporting complex SEND.
3	Lydia	Female	1-2-1	1 year and 3 weeks	Experience in EYFS and working with children with autism & Down Syndrome.
4	Liz	Female	1-2-1	3 weeks	Experience working with children with autism. Lived experience of neurodiversity.
5	Ruth	Female	TA/1-2-1	3 weeks	Speech and Language degree Experience with range of SEND including autism.

3.6 Phase 1: The Quantitative Aspect

The quantitative phase aimed to answer the first RQ and provide measurable data on the impact of using Intensive Interaction on early communication and interaction skills.

3.6.1 Single Case Experimental Designs

SCEDs originate from the work of Skinner (1974) and investigates causal relationships between an independent and dependent variable (Galassi & Gersh, 1993) utilising repeated measures over time and across phases (Kazdin, 2003). SCEDs are an effective way of establishing intervention efficacy for an individual (Reason & Morfidi, 2021) and are frequently used in research pertaining to children with SEND (Ledford et al., 2023).

Traditional group designs are criticised as they do not consider factors impacting an interventions success, and this could diminish the reliability of the results for heterogenous populations (Winter, 1997). This is effectively navigated using a SCED as meaningful data is produced at an individual level (Robson, 2011). The individualised nature aligns with the goals of SEND education (Repp & Lloyd, 1980), therefore SCEDs are often preferable when conducting research into SEND (Ledford et al., 2023), due to pragmatic difficulties in planning large scale research with low incidence or heterogenous groups (Kazdin, 1978).

Specific to those with SC&I needs, 83% of studies assessing the efficacy of interventions for autistic individuals use SCEDs (Steinbrenner et al., 2020). Kellett and Nind (2003) highlight that although further evaluative research into Intensive Interaction is required, due to the unique and complex needs of the learners, this population is unsuitable for large scale research projects. A SCED provides the opportunity to personalise intervention and review at an individual level (Jordan et al., 1998). Furthermore, as a SCED provides a simplified approach to intervention evaluation (Neuman & McCormack, 1995), it can be used within educational settings and school staff can lead data collection (Maydew & Atkinson, 2022).

However, SCEDs have been criticised as its individualised focus limits the generalisability of findings (Barlow et al., 2009). Group designs such as random control trials (RCT) or matched groups are more generalisable (Robson, 2011), however it is difficult to match individuals with complex SEND (Cakiroglu, 2012). Horner at al., (2005) argues a SCED holds more weight than case study designs, due to experimental control and scientific rigour, with Shavelson and Towne (2002) equating a SCED to an RCT, emphasising establishing evidence-based practice, on an individual level. More recently, Ledford et al., (2023) identified several task forces which have worked to increase SCED research standards, subsequently increasing the acceptance of their use in project design.

In a SCED, the participant acts as their own control, as the dependent variable, usually an observable behaviour (Horner et al., 2005) is measured throughout, and the independent variable e.g., implementation of an intervention, is manipulated across phases (Kratochowill et al., 2010). Whilst this highlights the interventions impact on an individual (Cakiroglu, 2012), it also provides a baseline measure of behaviours which illustrate current and predicted performance, should the intervention not be provided (Kazdin, 1978).

To attribute any behavioural improvements to the intervention, Maydew and Atkinson (2022) state the baseline should be stable prior to the intervention phase, however, there are ethical issues in withholding interventions that could support child development. Furthermore, Lane and Gast (2014) posit that participants may improve during a baseline due to maturation or external factors and if improvements are observed, this may raise questions around the necessity for intervention. Kazdin (1978) argues if improvements are observed, these may be slow, and any child who would likely benefit from intervention should receive it.

There are several designs utilised in a SCED, including an A-B, A-B-A and A-B-A-B design whereby A represents the baseline phase, and B represents the intervention phase (Kratochwill et al., 2010). The choice should be determined by the study's objectives, the phenomenon being measured, the independent variable and the context of the research (Kratochwill et al., 2010). The specific design impacts the

ability to establish a causal relationship between independent and dependent variable and the validity of the findings. Each design will now be discussed.

A-B Design

Described as a basic SCED (Shadish & Sullivan, 2011), this design utilises repeated measures taken throughout the baseline and intervention phases, aiming to attribute any changes observed within the intervention phase to the intervention alone (Barlow et al., 2009). Although this design has been criticised as changes may have occurred naturally, i.e., through maturation, (Risley & Wolf, 1972), there are a range of benefits to its use, including ease of implementation and cost efficiency (Heyvaert et al., 2017), arguably relevant when conducting research in educational settings. Furthermore, the A-B design is appropriate to evaluate interventions that cannot be removed for ethical reasons or where effects cannot be reversed (Michiels & Onghena, 2019).

A-B-A and A-B-A-B Design

Within these designs, the treatment variable is introduced and then withdrawn, possibly being reintroduced at a later stage. Intervention reversal improves the validity of the research and strengthens the relationship observed between variables (Neuman & McCormick, 1995; Barlow et al., 2009). Despite the positives in terms of research design, there are ethical dilemmas around removing interventions (Maydew & Atkinson, 2022).

Multiple Baseline Design

The intervention is introduced at different points in time, across subjects or behaviours, aiming to demonstrate a causal relationship between variables (Kazdin, 2003). Although this design navigates the ethical dilemma of intervention reversal, there are practical considerations around staggering intervention implementation (Kazdin, 2003).

3.6.1.1 A-B Design

For the current research, an A-B design was utilised to measure the child participants outcomes across the baseline and intervention phase of the research. Other designs were considered but were inappropriate due to the following reasons:

- A reversal design was inappropriate, due to ethical considerations and effects likely to be irreversible e.g., developing relationships (Cakiroglu, 2012; Maydew & Atkinson, 2022).
- A multiple baseline design was not possible due to the practicalities of providing training and fidelity checks across multiple participants during the timescale.

Phase 1 of this research project spanned from September 2024 to December 2024. Practical restrictions had to be considered including the researchers timescale and the length of school terms. Considering this, and students requiring a settling in period at the start of the academic year, phase A ran for 3 weeks, and phase B ran for 7 weeks. Further information regarding the baseline and intervention period is given in section 3.6.2 and 3.6.3 respectively.

3.6.1.2 Independent and Dependent Variables

The independent variable was the implementation of Intensive Interaction as an intervention, to be used daily with the child across phase B for 7 weeks.

The dependent variable was the child's scores on a measure created as part of this project, The Early Social and Communication Skills Framework, measured twice weekly by key adult participants (see section 3.6.1.3).

The repeated measure was triangulated with; pre and post measures focusing on Social Communication and Emotional Regulation, contextual information collected during the SCED, and qualitative data from phase 2 of the study.

Pre and Post Measure

Data collected at singular points has limited validity and reliability (Kazdin, 2003), however pre and post measure data was collected for triangulation purposes and to increase validity and reliability in the main findings (Robson, 2011).

The pre and post measure was an adapted observation form taken from the SCERTS (Social Communication, Emotional Regulation and Transactional Support) Model (see Appendix 14). The SCERTS Model is described as a multidisciplinary approach

enhancing communication and social-emotional abilities of individuals with autism and related social interaction needs (Prizant et al., 2003). The observation form is a criterion referenced tool taken from the SCERTS assessment process.

SCERTS was chosen as the model is designed to support those with SC&I needs, and encompasses a similar philosophy to Intensive Interaction, recognising the value of learning through social contexts. The curriculum-based assessment tools provide a flexible approach to measure CYP's progress (Molten et al., 2013) and have been used in a music therapy study with children with SC&I needs, whereby it was concluded to be useful in evaluating intervention efficacy (Walworth et al., 2009).

The SCERTS Model sequences goals into the social-communicative stages of Social Partner (preverbal intentional communication), Language Partner (emerging language and early language) and Conversational Partner (more advanced language stages). Based on the research population, the observation form for the Social Partner stage was utilised. Transactional Support statements were removed as they refer to interpersonal supports and would not measure the child's skills alone.

Key adult participants were asked to rate 97 statements about the behaviours of the child participant, e.g., "responds to bids for interaction".
Statements were marked as:

0 = Criterion not met
1 = Criterion met inconsistently
2 = Criterion met consistently across two partners/contexts

Scores were totalled across the subscales of Social Communication and Emotional Regulation.

Qualitative Information

Contextual information was gathered alongside the repeated measures using the data collection form, (see sections 3.6.2.2 and 3.6.3.2). Utilising methods and data typically associated with case studies strengthens the validity and reliability of a SCED (Neuman & McCormick, 1995) and illustrates factors which may have impacted the intervention (Kazdin, 1978). The use of qualitative data also allows

researchers to consider the social significance of change which may not be evident in other analysis methods (Neuman & McCormick, 1995) which is important due to the heterogeneity of participants needs, the limited behaviours typically measured in a SCED, and the use of a non-standardised repeated measure.

3.6.1.3 Early Social and Communication Skills Framework

Barlow et al., (2009) states an A-B SCED requires a defined target behaviour (which represents the phenomena of interest) to be measured repeatedly over the baseline (A) and intervention (B) period, to increase the external and social validity of the research (Ledford et al., 2023).

Previous research evaluating Intensive Interaction has highlighted challenges in identifying an appropriate tool to assess and record joint attention skills (Mourière & Scott-Roberts, 2017). Similarly, the researcher in the current study perceived existing tools to be unsuitable due to observational methods often being quantitative in nature, e.g., recording frequency of turn-taking. Considering the child-led nature of the intervention, the intervention period was likely to differ daily, making frequency scores meaningless. Additionally, defining a set of behaviours which would be appropriate to all participants would likely be impossible, due to the heterogenous nature of their needs.

Creating a Framework

The Early Social and Communication Skills Framework was created by the author as part of this project. A Thematic Analysis (TA) (Braun & Clarke, 2006) approach was utilised, whereby codes were identified across the literature focused on the outcomes of Intensive Interaction, published assessment tools and developmental measures, including:

- EYFS Development Matters (DfE, 2023)
- FoC (Hewett, 2023)
- Engagement Profile (Specialist Schools and Academies Trust, 2011)
- Routes for Learning (Welsh Government, 2020)
- Quest for Learning (CCEA, 2020)
- Pre Verbal-Communication Scale (Kiernan & Reid, 1987)
- SCERTS Model (Prizant et al., 2003)

- 7 Stages of Interaction (Firth & Barber, 2011)
- FOCAL Wheels (Mourière & Scott-Roberts, 2017)
- EQUALS Curriculum (Equals, 2025)
- Leuven Scales (Laevers, 2005)
- PIVATS (Lancashire County Council, 2015)

Codes were themed into categories, see example in Appendix 15. Initially, there were four themes; Communicative Methods; Attention and Engagement; Emotional Factors; and Connections and Relationships. During TA, the codes relating to Connection and Relationship were amalgamated into Emotional Factors, due to observed overlap and in line with The FoC2 (Hewett, 2023) which considers these factors as collaboratively prioritising emotional wellbeing. The three remaining themes are in Figures 7-9. Subthemes were then collated, illustrated in Figure 10.

Figure 7

Framework Development – Codes Relating to the Theme of Communicative Methods

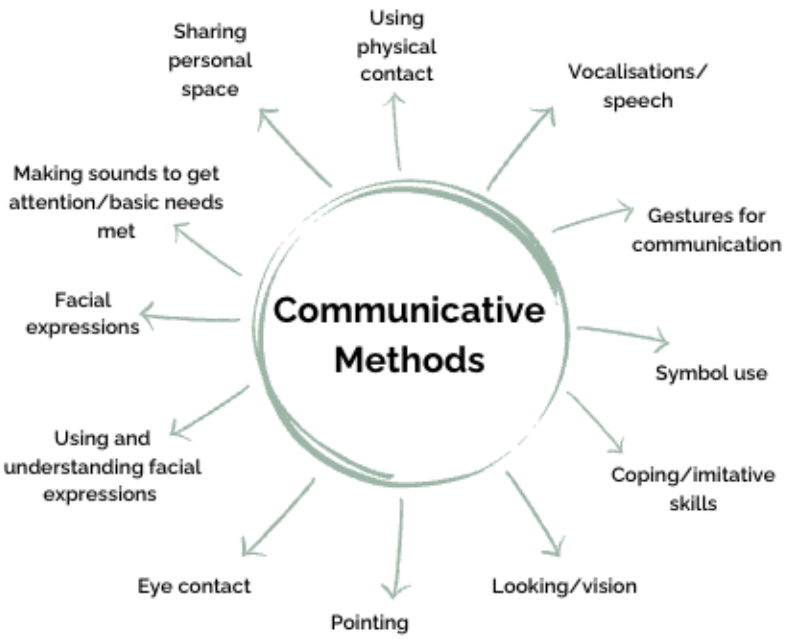


Figure 8

Framework Development - Codes Relating to the Theme of Attention and Engagement

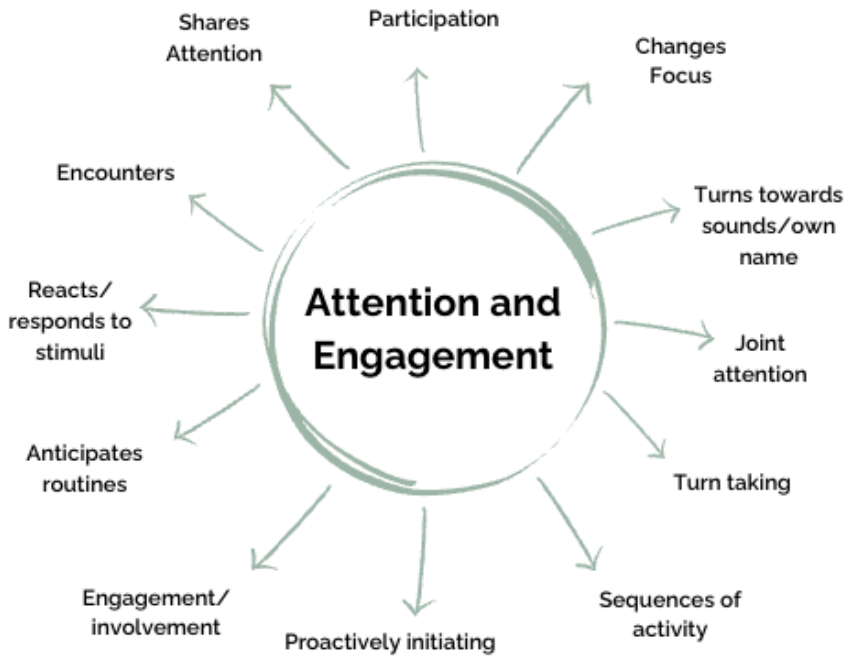


Figure 9

Framework Development - Codes Relating to the Theme of Emotional Factors

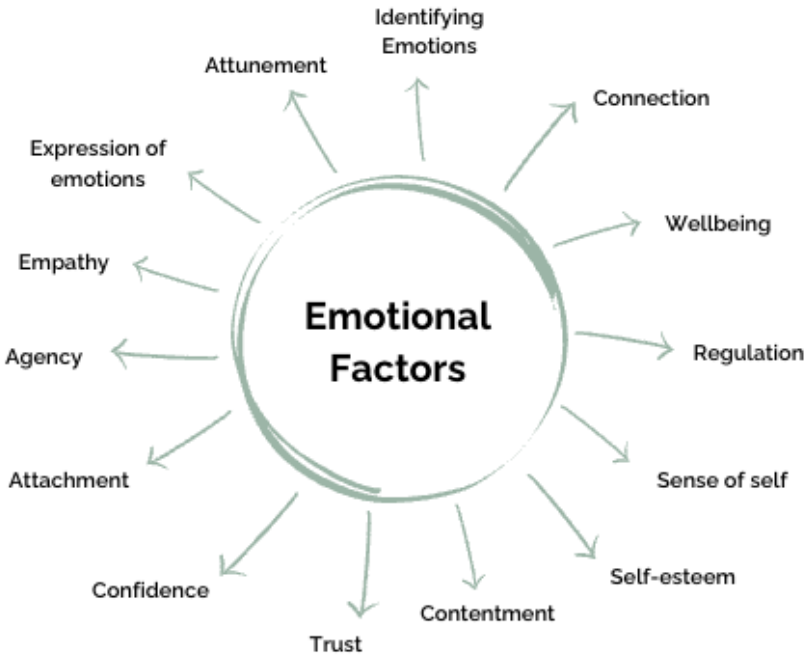


Figure 10

Framework Development – Themes and Subthemes

For two subthemes, published measures were considered adequate, therefore these were kept in the framework without adaptation. As these measures utilised Likert scales (Likert, 1932), scales were created for the remaining subthemes. Several subscales with a descriptor corresponding to a score from 1-5 were created, which would provide a total score for each area illustrated within in Figure 10.

Controlling for Validity and Reliability

As this measure was created by the author, robustness was assessed in several ways to enhance validity and reliability, outlined in Table 10.

Table 10

Methods Taken to Assess the Validity and Reliability of The Early Social and Communication Skills Framework

Criteria	**Assessed by:**
Content validity	Risk perceived to be low due to creation through TA of published measures that focused on early communication. Expert reviews were undertaken by TEP's and EP's aware of Intensive Interaction and experienced/knowledgeable in SC&I needs and assessment tools
Face validity	Reviewed through piloting
Construct validity	Expert reviews as above
Criterion validity	Not undertaken due to previous challenges in finding an appropriate measure (Mourière & Scott-Roberts, 2017), and the subjectivity of the measure impacting reliability of 'scores'.

The expert review processes aimed to check the purpose of the framework as an observation tool, themes generated from the TA and to ensure it was accessible and jargon-free.

Small changes were made prior to piloting, including:

- Clarifying differences between stages
- Ensuring each stage had an example
- Clarifying language used in descriptors

The final framework can be found in Appendix 16.

The researcher is aware of the framework's subjective nature; however, has sought to address this through the controls for validity and reliability above. Furthermore, by using a standardised level of training (explained in section 3.6.2.1) and ensuring the same adult fills in the repeated measure throughout the SCED, this reduces the impact of subjectivity. The measures were also subject to fidelity and inter-rater reliability checks, discussed in section 3.6.4.

3.6.2 Baseline Phase

The baseline phase took place between the 23.9.2024 and the 14.10.2024 for approximately 3 weeks. The literature debates the appropriate length of a baseline, as some stipulate it should include at least 5 data points (Kratochwill et al., 2010), whereas others denote 3 are sufficient (Horner et al., 2005). During the study's baseline, 6 data points were planned to be collected using repeated measures twice weekly.

3.6.2.1 Training

Key adult participants were trained by the researcher in the Early Social and Communication Skills Framework and the baseline procedure. This also provided participants a project overview and an opportunity to ask questions. During the training, participants watched a short video of an adult interacting with a young child to practise using the framework and the data collection form (discussed in 3.6.2.2).

To support treatment integrity, training was provided to participants at the educational setting they worked at, in a quiet room on an individual basis. The researcher used notes to ensure each participant was given the same information. Training ranged from 60 to 90 minutes, taking 68 minutes on average. See Appendix 17 for baseline training.

3.6.2.2 Procedure

Key adult participants were asked to interact with child participants as normal, for a period of up to ten minutes, to gather a baseline of the child's SC&I skills. It was not specified where this interaction should take place, however they were asked to use similar environments, and to consider the level of stimulation e.g., reading compared to playing musical instruments.

Key adults videoed the interaction using a school-owned electronic device such as a tablet, to support them in completing the Early Social and Communication Skills Framework retrospectively and accurately, so they would not need to rely on memory or attempt data collection during the interaction. Following the completion of the measures, key adults deleted the video recording. These recordings were not

collected as part of the data, nor were they viewed by anyone other than the key adult participant.

During the baseline, key adults were required to record their interactions with child participants twice weekly typically on the same days i.e., every Wednesday and Friday, and complete the repeated measure, using a secure online data collection form or a paper version, see Appendix 18 for an example.

3.6.3 Intervention Phase

3.6.3.1 Training

Key adults were trained by the researcher in the use of Intensive Interaction. The training discussed the background, principles and approaches and included two video clips so participants could see the intervention in practice. The training also reiterated the use of the Early Social and Communication Skills Framework and outlined the procedure for the intervention phase. The same treatment integrity procedures were used as the baseline phase. On average the training in Intensive Interaction took approximately 90 minutes. See Appendix 19 for the intervention training.

3.6.3.2 Procedure

Key adults were asked to utilise Intensive Interaction at least once every day with the child participant. Repeated measures were collected twice weekly typically on the same days i.e., every Wednesday and Friday, and sent to the researcher using the same data collection form as the baseline phase. Repeated measures were asked to be collected at the same times of the day if possible.

As in the baseline phase, key adults were required to record the Intensive Interaction sessions prior to filling in the repeated measures, for accuracy. Video recordings were deleted once data collection was complete, and recordings were not gathered as part of the data or viewed by anyone other than the key adult interacting with the child.

3.6.4 Fidelity Checks

Although SCED data collection can be undertaken by school staff (Maydew & Atkinson, 2022), researchers should check intervention implementation and data collection is being completed as planned to improve the reliability of the results (Kazdin, 1978). This is particularly important when the likelihood of expectancy bias is high, for example when data collection utilises a subjective method such as scaling (Collier-Meek et al., 2021), as this study does.

In the current study, the researcher visited each set of participants throughout the baseline and the intervention phases to complete fidelity checks. In addition to the procedures below, this provided an opportunity for participants to ask questions as needed and for the researcher to check the suitability of the participants. As discussed, two sets of the participants were excluded during fidelity checks, as the children's communication skills were too advanced for Intensive Interaction.

During the baseline, one fidelity check was conducted at each setting, to check participants were adhering to the procedures and completing measures as planned. The researcher observed the interaction, completing measures themselves to compare to the measures completed by the key adult in school. The purpose of this was to check the reliability of the measures.

During the intervention phase, two fidelity checks were planned for each school. The researcher visited the schools and observed the Intensive Interaction session, to ensure the intervention was delivered in line with the training provided and conducted the same procedure as within the baseline fidelity checks for data reliability.

Inter-rater reliability percentage agreement was calculated to illustrate the extent to which the researcher agreed with the key adult's evaluation of the child's communication skills during each fidelity check. This was calculated using Cohen's Kappa (Cohen, 1960) using an online statistics tool, (DATAtab Team, 2015). To define the levels of agreement, Landis and Koch's (1977) categories were used, as outlined within Table 11.

Table 11

Levels of Agreement for Cohen's Kappa (Landis & Koch, 1977)

Kappa	Level of Agreement
> 0.8	Almost perfect
> 0.6	Substantial
> 0.4	Moderate
> 0.2	Fair
> 0	Slight
< 0	No agreement

The results for the inter-rater reliability checks are presented with each participant's results within section 4.2.

3.6.5 Quantitative Data Analysis

Data from the repeated measures was graphed and analysed using a visual analysis process explained by Kratochwill et al (2010). Variables such as level, trend, variability, immediacy of effect and overlap were analysed, considering overall data trends due to the likelihood of day-to-day fluctuations (Barlow et al., 2009). Criteria used in the current study to analyse data across and between phases (Kazdin, 2003) is outlined within Table 12.

Table 12

Criteria for Evaluating Single Case Data Using Visual Analysis

Characteristic	Description
Level	The mean score for each data phase. A positive value indicates an increase in mean.
Trend	The slope of the best fitting line for the data within a phase, computed using linear trend lines in Microsoft Excel.
Variability	The standard deviation of data about the line of best fit.
Immediacy of effect	Change in level between the last 3 data points of a phase and the first 3 data sets of the next phase.
Overlap	The proportion of data which overlaps across both phases.

Inter-rater Reliability

As visual analysis is a subjective method, there are issues with reliability (Kazdin, 1978). In the current study, the graphs were analysed by the researcher and another TEP, familiar with SCEDs, using inter-reliability to increase the reliability of the results (Neuman & McCormick, 1995).

Both evaluators used the criteria in Table 12 and were asked to rate on a scale from 1 (not at all convinced) to 5 (very certain) a response to the following question:

"How certain or convinced are you that the child's scores on the subscale underwent a notable improvement from the baseline to the intervention phase?"

Evaluators were asked to answer this question for the 3 subscales for each participant, see Appendix 20 for how this data was gathered. The extent to which the raters agreed was then calculated using Cohen's Kappa (Cohen, 1960) using an online statistics tool, (DATAtab Team, 2025). To define the levels of agreement, Landis and Koch's (1977) categories were used, as outlined within Table 11. The result from the inter-rater reliability check for visual analysis can be found in section 4.2.7.

Statistical analysis was considered in addition to visual analysis, as statistical analysis may capture smaller effects and can be useful in the case of unstable baselines (Kazdin, 2003). Various statistical analyses were considered and deemed inappropriate for the following reasons:

Conventional T and F Tests

- Unlikely to be valid due to small sample size.
- Tests assume each data point is independent (Barlow et al., 2009). As a repeated measure is utilised, autocorrelation is likely.
- Tests do not account for trends in the data (Barlow et al., 2009).

Interrupted Time Series Analysis (ITSA)

- Requires at least 50 data points, (Barlow et al., 2009) which this study does not have.

Randomisation Tests

- The current research utilised a non-random assignment of treatment to measurement occasions.

Statistical analysis of pre and post measures was also deemed inappropriate, as this study focuses on a small number of participants with data being analysed at an individual level, and the nature of the intervention is individualised to each participant and their key adult. The use of Reliable Change Index (Jacobson & Truax, 1991) was considered to identify statistical and clinical significance between the pre and post measures, however as the SCERTs observation form is not standardised, this was also inappropriate. The results are therefore presented and discussed descriptively.

3.7 Phase 2: The Qualitative Aspect

This phase aimed to investigate any outcomes not directly captured by the repeated measures in phase 1 and explore the experiences of the adults facilitating Intensive Interaction within a mainstream setting, highlighting factors perceived to support or hinder the implementation.

3.7.1 Semi-Structured Interviews

Semi-structured interviews provide an opportunity for participants to share their experiences (Willig, 2009) and to identify factors which impacted the implementation of interventions. This is imperative for professionals seeking to boost development for SEND children (McDuffie & Scruggs, 2008), in topics which they may not have experienced (Silverman, 2013).

Semi-structured interviews are widely utilised (Robson & McCarten, 2016); and especially appropriate when the interviewer is closely involved in the research (Mertens, 2015) as in the current study due to the frequent involvements of the researcher. Willig (2009), states semi-structured interviews include aspects of formal interviewing, such as fixed roles, and an interview agenda, however, makes effective use of informal conversation emphasising experience and open-ended questions. The interview agenda (discussed in section 3.7.2), provided elements of structure, however, was also guided by interviewees responses (Mertens, 2015) and the researchers knowledge of the intervention, specific to their setting.

Interviews, are however, a time-consuming data collection approach (Robson & McCarten, 2016), therefore focus groups were considered as a contingency, due to the efficiency of the technique (Robinson, 1999). Focus groups are group interviews,

embracing group interactions, which differ from the typical question and answer style in individual interviews (Merterns, 2015; Kreuger & Casey, 2009).

Semi-structured interviews were preferred due to disadvantages of focus groups in terms of group dynamics and confidentiality (Robinson, 1999), which may impact the participants willingness to express their views honestly (Willig, 2009). In addition, the limited number of participants who took part in the current study is lower than the optimum group size, ranging from 6-12 participants (Stewart & Shamdasani, 1990; Morgan, 1997). This was concluded to be an inappropriate method of data collection, and individual semi-structured interviews were utilised.

3.7.2 Data Collection Procedures

Prior to conducting the interviews, an interview guide was created to outline the main questions which covered the studies purpose, aims and RQ's. These were supported by follow up questions relevant to answers provided by each interviewee (Willig, 2009) which could not be planned for and were considered during the interview itself (Whiting, 2008).

Mertens (2015) advises interview guides should include introductory comments, topic headings with key questions, prompts and closing comments. Key questions were organised by the following headings:

- Intensive Interaction sessions
- Impact on CYP
- Implementation

See Appendix 21 for the interview guide.

The interview questions were reviewed during the pilot (see section 3.4) to ensure they were free from jargon. Questions were open ended to gather rich descriptive data and aimed to reduce bias by not leading the interviewee. Throughout the interviews the researcher made use of member checks to ensure they had interpreted the interviewee correctly and to increase data reliability.

The interview guide was not formally shared in advance, however due to the working relationship across the scope of this research, the interviewees were reassured and

informed verbally that interviews would be related to their experiences of Intensive Interaction and the outcomes for CYP.

Interviews took place at the mainstream primary setting which the research took place in. Participants were offered the opportunity to meet elsewhere if preferred. All interviews were undertaken in a private room, to ensure anonymity and to support participants in sharing their views comfortably.

During the introductory comments stage, participants were regiven the information sheet provided at the outset of the research (Appendix 11) and reminded of the anonymity processes, right to withdraw and/or to redact any aspect of the interview. Permission was then sought to audio record the interview. Interviews were recorded electronically and stored on an encrypted external drive until transcription, at which point the audio recordings were deleted and all identifying information was removed.

At the end of each interview, participants were provided with a debrief form (Appendix 22). Processes regarding confidentiality, consent, data storage and right to withdraw were reiterated. A debrief form was also provided for the caregivers of the children who had taken part, with the same information.

5 interviews were undertaken in January 2025, ranging from 31 to 59 minutes. The average time spent interviewing was 44 minutes.

3.7.3 Qualitative Data Analysis

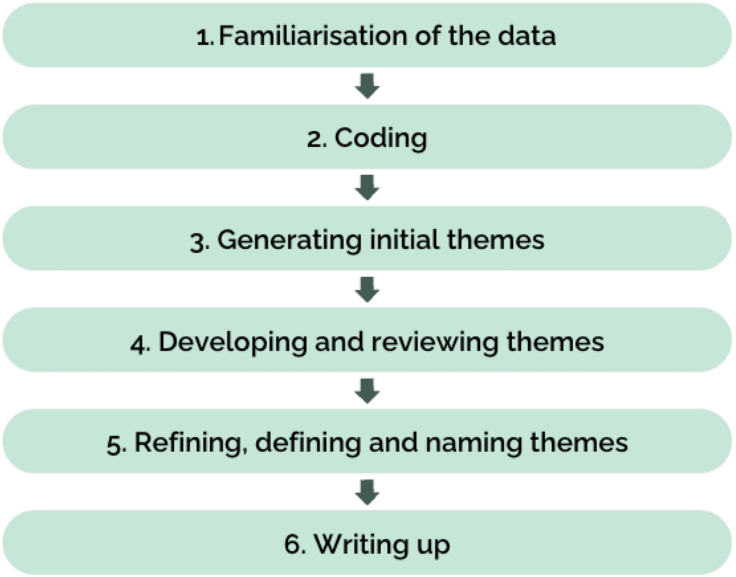
Thematic Analysis (TA) is a family of approaches (Fugard & Potts, 2020) that provide methods for identifying, analysing and reporting patterns or themes within data (Braun & Clarke, 2006). This was chosen due to its value in exploring individual perceptions and experiences (Braun & Clarke, 2013), in the hopes it would develop contextual understanding of using Intensive Interaction in mainstream education and provide rich data to supplement the findings of phase 1 (Robson & McCartan, 2011). Furthermore, as the approach is appropriate across a variety of theoretical frameworks (Braun & Clarke, 2013), it was viewed to be compatible with the researcher's pragmatic epistemological stance.

Despite this, it is argued TA cannot be undertaken within a “theoretical vacuum” and the paradigmatic, epistemological and ontological assumptions of the analyser inescapably inform the analysis (Braun & Clarke, 2021). Therefore, Reflexive Thematic Analysis (RTA) was utilised, whereby the researcher acknowledges the impact of their position and values on the analytical process and generation of themes (Braun & Clarke, 2022).

Critics of qualitative data analysis suggest it may lack scientific rigour (Robson & McCartan, 2011). To this end, Braun and Clarke (2006) devised a set of guidelines which presents six phases of TA, illustrated in Figure 11. Although presented as a linear process, Braun and Clarke (2006) emphasise the importance of TA being recursive in nature, encouraging the researcher to revisit phases as necessary.

Figure 11

Phases of RTA (Braun & Clarke, 2022)



To further support the scientific rigour several key decisions should be made prior to the analysis process. Braun and Clarke (2020) note coding can be either inductive, (data driven) or deductive (theory driven). As the current study is interested in participants experiences of using Intensive Interaction, an inductive approach was chosen to ensure the themes are grounded within the data (Patton, 2002). Themes

can be interpreted at either a semantic or latent level (Braun & Clarke, 2006), whereby semantic refers to the explicit data shared, compared to considering the underlying ideas or implied concepts at a latent level (Braun & Clarke, 2020). The current study utilised a semantic approach whereby only the explicit comments of participants were analysed.

The following sections describe the specific RTA procedure taken. During each phase the researcher reflected on their interpretation of the data through research diary entries relating to the RTA process and each theme (see Appendix 23 & 24).

3.7.3.1 Phase 1: Familiarisation of Data

Audio recordings of each interview were listened to and then transcribed. To check for accurate transcription, the recording was listened to for a second time whilst the written transcription was read through. Transcripts were re-read, and notes were added to identify extracts of interest.

3.7.3.2 Phase 2: Coding

This stage aimed to identify aspects of the data relevant to each RQ. Individual transcripts and accompanying notes were re-read and any data which was relevant to the RQ was coded, using a complete coding method (Braun & Clarke, 2013) whereby each data extract was summarised into a short phrase. Initial codes were revised as overlaps were identified, and some were disregarded as they reflected the view of one individual or were irrelevant to the RQ. Data extracts were revisited to ensure they collectively gave a representation of the code.

3.7.3.3 Phase 3: Generating Initial Themes

Codes were provisionally grouped into candidate themes which contained different ideas around a central concept. These were reorganised as data extracts were collated and checked to ensure the theme accurately represented the data. At this point, some codes were removed due to limited data to support a theme, however codes that appeared pertinent to the RQ were themed independently such as ‘factors can only increase success – challenges are not insurmountable’.

3.7.3.4 Phase 4: Developing and Revisiting Themes

Themes were reviewed, which resulted in some themes being disregarded or revised. For example, the theme 'Individual differences within and between communication partners' was initially two separate themes which considered factors relating to key adults and children individually. On reflection, there was limited data regarding children's individual differences, and the majority focused on key adults perceptions, so these were merged to convey the importance of this as an overarching theme.

3.7.3.5 Phase 5: Refining, Defining and Naming Themes

Each theme was refined and named, ensuring each theme was discrete. At this point, subthemes were created to ensure topics captured within the larger themes were clear. Final iterations were made, as the author reflected on their interpretation of the data. For example, distinguishing the difference between 'the use of Intensive Interaction approaches' and overall 'buy in' meant subthemes and codes relating to 'being given permission' were reorganised. Data extracts were rechecked to ensure revisions maintained integrity to the raw data.

3.7.3.6 Phase 6: Writing Up

At this point, the recursive nature of the approach was evident, as themes were tweaked as the researcher reflected on their interpretation during write up processes. A hierarchal overview and an in-depth discussion of the themes for each RQ can be found in section 4.3.

3.8 Validity and Reliability

3.8.1 Establishing Trustworthiness of Quantitative Data

3.8.1.1 Internal Validity

Internal validity is achieved if changes observed within the dependent variable can be attributed to the effect of the independent variable, and not to any extraneous variables (Cohen et al., 2011). Research should take steps to control for internal validity so accurate inferences can be drawn about the impact of the research (Creswell, 2003).

Table 13 describes the potential threats to validity perceived as relevant to this study and the actions taken to mitigate each threat. Threats not adequately controlled for will be discussed as limitations (see Chapter 5).

Table 13

Threats to Internal Validity and Steps for Mitigation

Threat	Actions Taken
History	It was requested no additional interventions began during the research Anecdotal data gathered to consider impact of real-world events on findings
Maturation	Use of multiple cases Use of repeated measures over time for single participant and sufficient time for stable baseline (Kratochwill et al., 2010) A settling in period to the new academic year provided
Testing	Customisation period of using video recording within classrooms Triangulation data with pre/post measures and interview data Staff coached in intervention post baseline phase Data collected by key adults to eliminate researcher bias Key adult bias remains an issue however, staff were reminded outcomes were not guaranteed, limiting their expectations
Instrumentation	Key adults trained by researcher in using measures. Standardised level of coaching, checked for quality (Kratochwill et al., 2010) All measures collected by same key adult in each case to account for subjectivity Key adults instructed to complete measures using video recording to support accuracy Fidelity and reliability checks (Morgan & Morgan, 2009) To improve construct validity, measures were piloted and subject to reliability and validity checks (see section 3.6.1.3).
Statistical regression	Use of repeated measures reduces threat Threat remains to pre and post measures, however this data is subsidiary

Hawthorne effect	Not able to be controlled for due to study design. Overall results mitigated by mixed methods and collection of qualitative data

Note: paraphrased from Mertens (2005) and Robson & McCartan (2016)

3.8.1.2 External Validity

External validity refers to the extent that the findings from an individual study can be applied to another situation, or generalised to the wider population (Mertens, 2005; Cohen et al., 2011), understandably a contentious issue for SCEDs as naturally the design focuses on one participant, context and point in time (Horner et al., 2005). To improve external validity in the current study, extensive detail about the sample of participants is provided and multiple cases are utilised, as suggested by Horner at el., (2005). It is however, acknowledged the small sample size impacts generalisability of conclusions. (Barlow et al., 2009).

3.8.1.3 Reliability

A studies reliability is dependent upon the consistency and stability of which something is measured, (Robson, 2011). Table 14 highlights the threats to reliability in the current study, alongside mitigating actions. As a framework was created as part of this study, this threat is considered within section 3.6.1.3.

Table 14

Threats to Reliability and Steps for Mitigation

Threat	Action Taken
Participant Error	Repeated measures were undertaken at the same time and day each week Anecdotal evidence was collected to inform the researcher of the presence of extraneous variables
Participant Bias	The complexity of the children's needs reduces this threat A customisation period for video recording was utilised
Observer Error	Participants asked to complete measures immediately following interactions and watch recordings to improve accuracy Researcher highlighted procedural expectations throughout the project and ensured SLT provided staff time to complete procedure Inter-rater reliability during fidelity checks
Observer Bias	Triangulation with pre/post measures and qualitative data Measures completed based on individual interactions Reminded adults outcomes may not be observed and should not be expected

3.8.2 Establishing Trustworthiness of Qualitative Data

Standards for evidencing quality in qualitative research projects are imperative due to the historic scrutiny of their ability to contribute towards evidence-base evaluations (Mertens, 2005). Due to the researcher's involvement within data collection and analysis procedures, the steps taken to enhance the trustworthiness of the findings are evidenced within this section.

Table 15 highlights the relevant criteria to judge qualitative research, as outlined by Guba and Lincoln (1989) and Lincoln (2009), alongside steps taken to mitigate possible threats in the current study. Where threats have not been adequately controlled, these will be discussed within the research limitations in Chapter 5.

Table 15

Actions Taken to Support Trustworthiness of Qualitative Data

Criteria	Mitigating Actions
Credibility	Member checks completed during interviews (Cho & Trent, 2006) Participants encouraged to share their views honestly and reassured their experiences were valid Researcher had prolonged involvement across research project, providing contextual understanding Triangulation across multiple participants and other forms of data (SCED & pre/post measures)
Transferability	Participants representative of support staff within mainstream schools Description of context and participants provided Interviewed multiple participants
Dependability	Detailed description of design, data collection and analysis
Confirmability	Data checked and rechecked Codes built from data extracts Reflexivity maintained and checked using researcher journal (Mertens, 2015)
Authenticity/ Transformative	All voices considered including contradictions Member checks during interviews Results pertaining to CYP shared to support SEND processes

3.9 Ethical Considerations

Several ethical considerations were made in the planning and implementation of this the research, with reference to the British Psychological Society's Code of Ethics and Conduct (BPS, 2021) and the Health and Care Professions Council's Standards of Proficiencies (HCPC, 2023). This study also adhered to the Code of Research Conduct and Research Ethics provided by the University of Nottingham (UoN, 2023) and received ethical approval by the UoN School of Psychology Ethics Committee on the 11th of June 2024 (see Appendix 25).

3.9.1 Informed Consent and Child Assent

Informed consent was gathered from caregivers of the participating children and key adult participants. Prior to consenting, they were provided with an information sheet and an opportunity to ask questions. Due to the recruitment process, the researcher was cautious of the ethical dilemma if school staff were encouraged to take part by SLT, however this was alleviated by each key adult providing consent, in addition to private meetings whereby informed consent was confirmed.

Written/verbal consent was not gathered directly from the children participating in the research due to the complexity of their needs, however, the study emphasised child assent. Intensive Interaction itself states interactions must stop when the child no longer wants to engage with another. Furthermore, the SCED measure considered a child's emotional regulation and stipulated the intervention should end if the child is extremely dysregulated. These principles were reiterated throughout the training and check in procedures.

3.9.2 Confidentiality

Consent forms were stored electronically on a password protected device to ensure confidentiality. Data collection methods used a secure online form which adhered to the UoN's GDPR policy. For participants who preferred paper forms, these were sent to the researcher electronically. Copies were stored on a password protected device and the originals were destroyed by participants in school.

Interviews were audio-recorded on two digital recording devices and stored on a password protected device. Upon transcription, audio recordings were deleted, participants were given pseudonyms to ensure anonymity, and other identifying information e.g., school names were removed. Information such as individuals names and school settings were only known to the researcher and any EP's at the service who signposted interested schools to the project.

3.9.3 Right to Withdraw

Those who provided informed consent were reminded of their right to withdraw throughout the research. This was reiterated in the information sheets (Appendices 9 & 11), consent forms (Appendices 10 & 12) and debrief forms (Appendix 22).

3.9.4 Risk of Harm

The potential for harm was perceived to be minimal however, the researcher was aware procedural aspects such as using video may have been uncomfortable for participants and in addition, sensitive topics of conversation regarding organisational issues to their place of work may have arisen during interviews.

To alleviate this, participants had frequent check ins via email and during fidelity checks, whereby the researcher asked questions specific to the procedure and ensured participants remained willing to participate. Prior to the interviews, the researcher informed participants the conversation could be paused at any point and sections could be redacted. This was checked at the end of each interview and participants were reminded of their right to withdraw.

3.9.5 The Dual Role of the Researcher

The researcher holds a dual role, as a researcher evaluating Intensive Interaction in mainstream schools, in addition to their role as a TEP, providing psychological support to schools within the county. Therefore, there was a risk some schools and participants may have been known to the researcher, which could have impacted the participants willingness to share their experiences of the intervention, including any challenges in implementation. To alleviate this, in addition to the procedures relating to confidentiality, the researcher ensured a distinct understanding of roles was provided to all participating schools and adhered to. Only information explicitly gathered as part of research was included in data collection and analysis.

3.10 Stakeholders

3.10.1 The University of Nottingham

This research was undertaken as part of the professional training for the Doctorate in Applied Educational Psychology at the UoN. Careful discussion was undertaken

to ensure the research met the expectations of the professional training, and the institutions research and ethical guidelines.

3.10.2 The Educational Psychology Service

Throughout the completion of the study, the researcher was employed as a TEP within an EPS. Permission to conduct the project was sought from the Principal Psychologists via email. The research topic was of interest to the service, and in addition, made use of elements of coaching procedures used in service delivery. The research was undertaken in schools supported by the service.

3.10.3 Participating Schools, Staff, Children and their Caregivers

Involved were schools who were willing to release staff for training, check ins and interviews with the researcher, alongside providing staff the opportunity to deliver the intervention and complete measures as planned. Key adults participating in the research needed to consent to the above and be comfortable filming themselves as part of the research procedure. Although caregivers were not directly involved, they consented to their children's participation, and in addition, the outcomes of the study were likely to be of interest to them as they focused on their child's development.

3.10.4 The Researcher

The researchers interest in the topic was central to the planning of the project. Throughout the study, the researcher aimed to conduct the research in an ethical and unbiased manner, with consideration to the chosen methodology and their epistemological standpoint.

4. Results

4.1 Introduction to Chapter

The following chapter presents the findings of the study in two parts due to the separate research phases and mixed methodology.

Phase 1

The results from phase 1 will illustrate the outcomes of using Intensive Interaction on the early social and communication skills of individual children. The findings from the pre and post measures completed by key adults will be presented and repeated measures data will be analysed to answer the first RQ.

Reliability data will be provided to exemplify the level of agreement between the researcher and each participating key adult. To calculate this, joint observations were planned to be undertaken across the research, once during the baseline phase and twice in the intervention phase. During joint observations, the researcher considered treatment fidelity and completed The Early Social and Communication Skills Framework to compare levels of agreement in the data collected.

As described in section 3.6.5, visual analysis was utilised for each subscale across the participants, following characteristics proposed by Kratochwill et al., 2010. Inter-rater reliability checks relating to visual analysis will be presented at the conclusion of this section.

Contextual information pertinent to each participant will be provided that may explain their results. This information was gathered during data collection, fidelity checks and from interviews with key adults in phase 2 of the research.

A summary of the results from Phase 1 is then presented.

Phase 2

The findings of phase 2 explore all three RQ's, adding weight to the findings of phase 1 before considering the experiences of key adults and factors perceived to have impacted the implementation within mainstream schools. RTA is utilised to generate patterns across the qualitative data. The chapter closes with a short summary of these findings.

4.2 Phase 1 Findings

The initial quantitative phase of the research aims to provide evidence towards RQ1: What are the outcomes of using Intensive Interaction on early communication skills?

4.2.1 Charlie's Results

4.2.1.1 Pre and Post Measure

Table 16

Charlie's Pre and Post Measure Scores in Social Communication

	Pre	Post	Change
Joint Attention	19	38	+19
Symbol Use	18	49	+31
Social Communication	**37**	**87**	**+50**

Table 17

Charlie's Pre and Post Measure Scores in Emotional Regulation

	Pre	Post	Change
Mutual Regulation	13	30	+17
Self-Regulation	4	25	+21
Emotional Regulation	**17**	**55**	**+38**

Table 16 shows that Charlie's key adult's perception of Charlie's Joint Attention behaviour and symbol use increased following the intervention. A larger increase was reported for Charlie's Symbol Use (e.g., imitating actions, using vocalisations or non-verbal means to share intentions). Charlie's key adult's perception of Charlie's Emotional Regulation, found in Table 17, also increased following the intervention phase, with a similar level of change identified across Mutual Regulation and Self-Regulation.

4.2.1.2 SCED: Communicative Methods

Figure 12 illustrates Charlie's results from Communicative Methods across the baseline and intervention phase. The results of the visual analysis are provided within Table 18.

Figure 12

A Graph to show Charlie's Scores on the Communicative Methods Subscale Across the Baseline and Intervention Phase

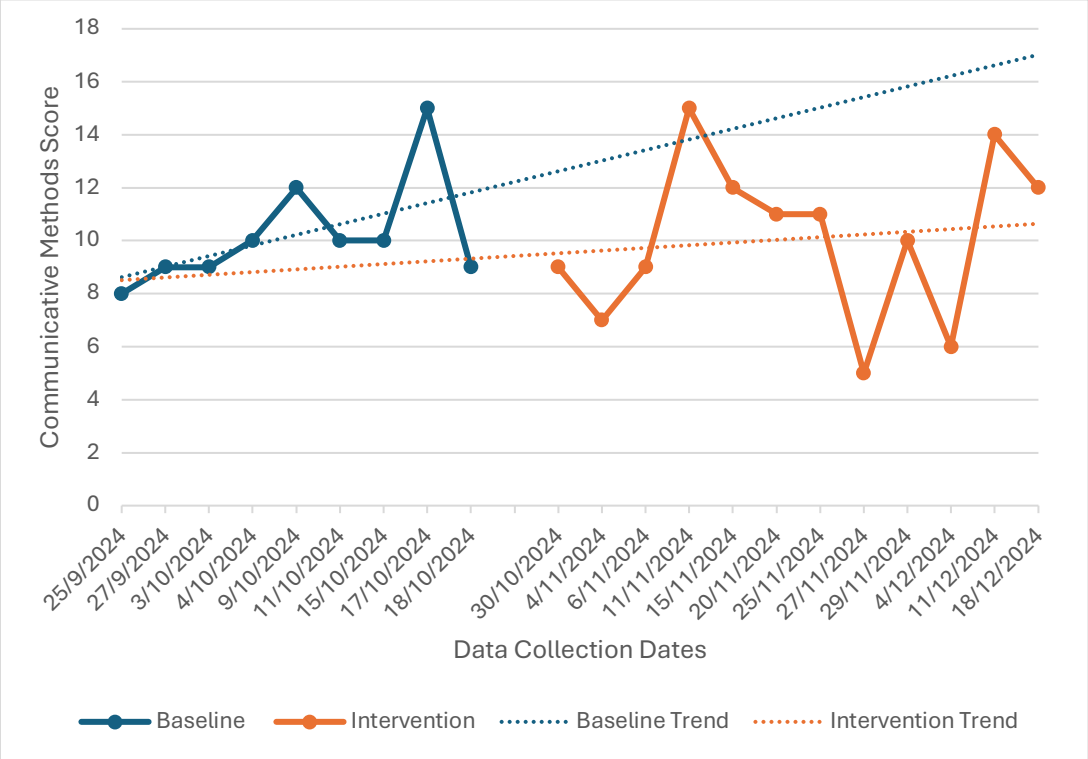


Table 18

Visual Analysis of Figure 12

Characteristic	Visual Analysis
Level	Figure 12 shows Charlie's mean scores reduced slightly from the baseline (10.22) to the intervention phase (10.08).
Trend	Both trend lines illustrate an incline, with a steeper incline observed within the baseline phase.
Variability	The Standard Deviation's (SD's) across the phases suggest a relatively low level of variability, with less variability observed in the baseline data (SD: 2.11) than the intervention data (SD: 3.06).
Immediacy of Effect	The initial intervention data points are broadly within the large variation of data observed at the end of the baseline phase with a small decrease observed across intervention's outset.
Overlap	Figure 12 illustrates all the data in the baseline overlapped with the broader range of data in the intervention phase.

The interpretation of Charlie's Communicative Methods results is challenging due to the variation across the phases. It could be argued much of the baseline is stable and the data collected on the 17/10/24 may be an outlier, however the variability within the intervention phase remains a relevant concern. Due to the fluctuations across the data and the overlap between the phases, it does not appear that Intensive Interaction has had a positive effect on Charlie's Communicative Methods.

4.2.1.3 SCED: Attention and Engagement

Figure 13 illustrates Charlie's results from Attention and Engagement across the baseline and intervention phase. The results of the visual analysis are provided within Table 19.

Figure 13

A graph to show Charlie's scores on the Attention and Engagement subscale across the baseline and intervention phases

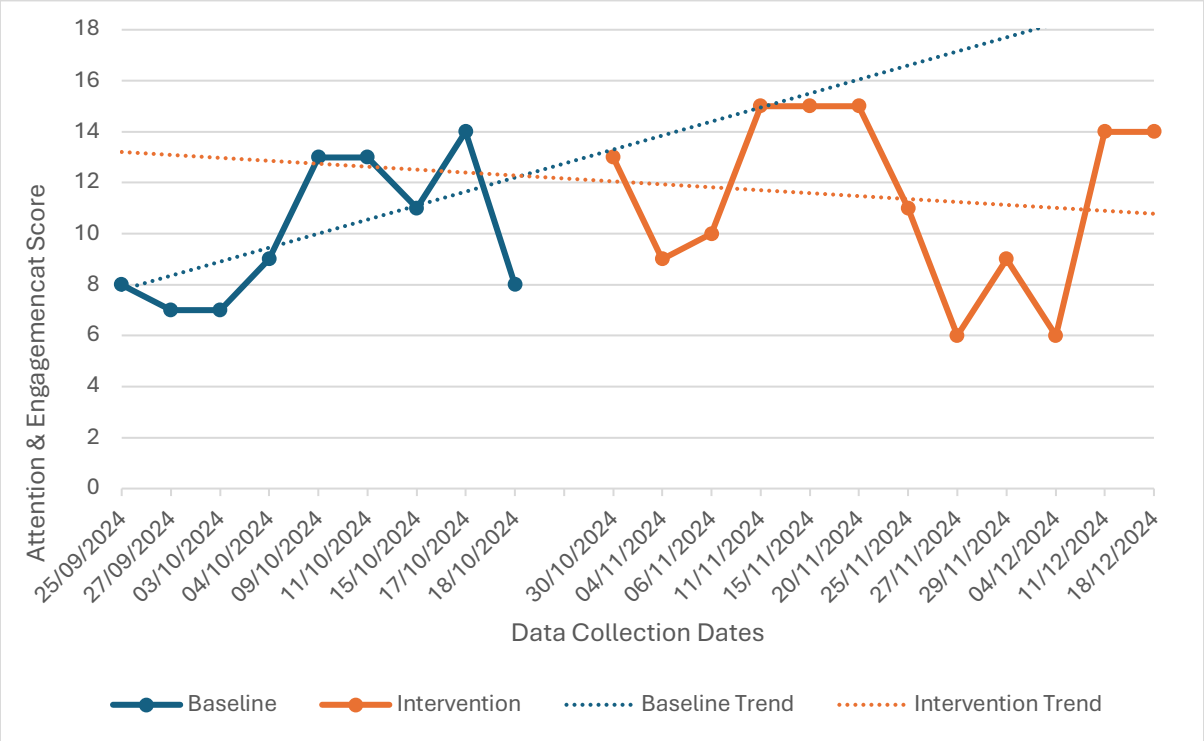


Table 19

Visual Analysis of Figure 13

Characteristic	Visual Analysis
Level	The mean increased from the baseline phase (10) to the intervention phase (11.42).
Trend	The baseline trendline shows a relatively steep incline, whereas the trendline for the intervention phase shows a steady decline.
Variability	Figure 13 illustrates a small variability across the baseline phase (SD: 2.73) and greater variability in the intervention phase (SD: 3.4).
Immediacy of Effect	The initial three data points in the intervention phase are within the same range as those at the end of the baseline, however an immediate increase is observed.
Overlap	The data in the intervention phase overlaps all the data collected in the baseline.

Due to the significance of the overlap in data and variation across both phases, the data collected relating to Attention and Engagement suggest little change during the intervention phase.

4.2.1.4 SCED: Emotional Factors

Figure 14 illustrates Charlie's results from Emotional Factors across the baseline and intervention phase. The results of the visual analysis utilising are provided within Table 20.

Figure 14

A graph to show Charlie's Scores on the Emotional Factors Subscale across the Baseline and Intervention Phases

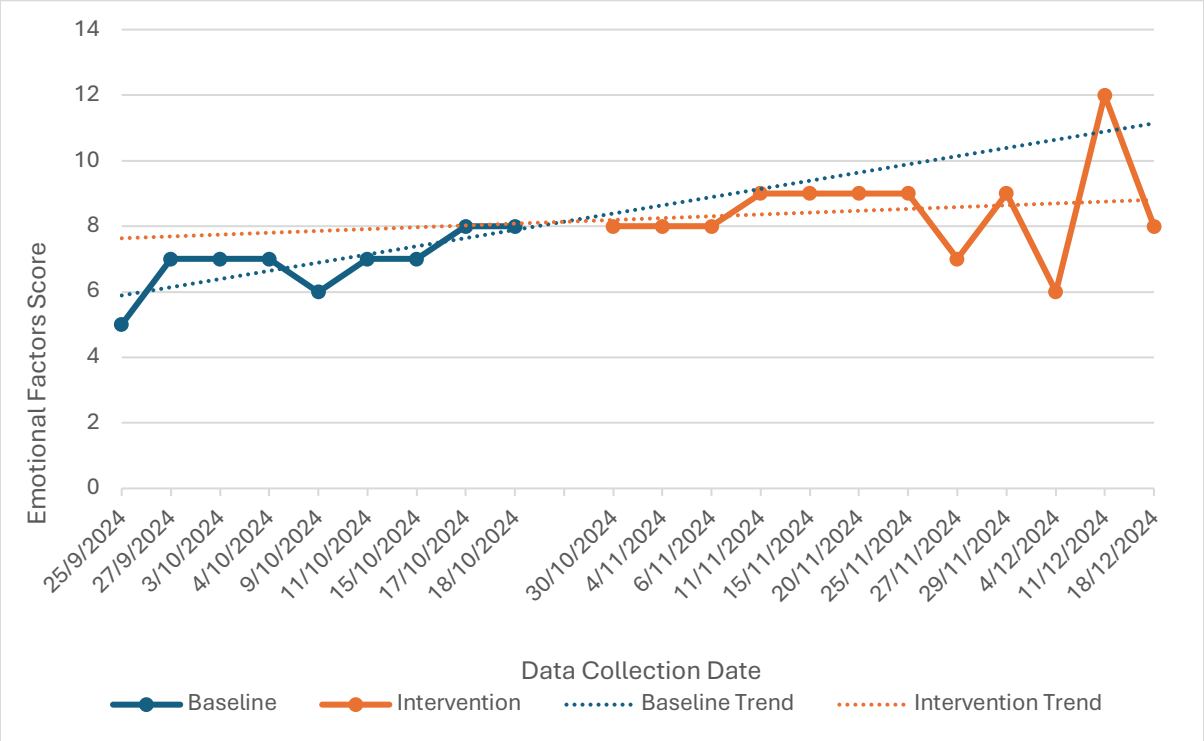


Table 20

Visual Analysis of Figure 14

Characteristic	Visual Analysis
Level	Figure 14 shows the mean increased from the baseline phase (6.89) to the intervention phase (8.5).
Trend	The trendlines for both phases illustrate an incline, however this is steeper for the baseline phase.
Variability	The variability across both phases shows a stable range of data around the line of best fit, with less variability within the baseline phase (SD: 0.93) compared to the intervention phase (SD: 1.45).
Immediacy of Effect	There is not an immediate effect observed in Figure 14, as initial data points for the intervention phase are within the same range as the final data points in the baseline phase.
Overlap	Half of the data within the intervention phase overlaps the data collected in the baseline.

Visual analysis of Figure 14 indicates a possible positive impact of the intervention on Emotional Factors associated with early communication skills; however, this should be interpreted with caution due to the minute differences observed, and the change in contextual factors for this participant, described in section 4.2.1.6, which impact the ability to note causal relationship between the intervention and any findings.

4.2.1.5 Inter-rater Agreement

Cohen's Kappa coefficient (Cohen, 1960) was calculated to provide a measure of inter-rater agreement. The Cohen's Kappa was 0.46, which according to Landis and Koch's (1977) categories would suggest a moderate level of agreement between the key adult and the researcher. The p-value from the Cohen's Kappa calculation was statistically significant at <0.001 which suggests the observed agreement is unlikely due to random chance.

4.2.1.6 Contextual Factors

Contextual information was gathered during data collection procedures, fidelity checks and phase 2 interviews which should be considered in relation to the reliability of the findings from phase 1. These include:

- Charlie moved to an enhanced resource unit within the setting after the intervention had begun (15/11/24). From this point, interaction sessions took place within this room, amongst a smaller group of children with similar needs. Although SCED designs plan for one independent variable to change (in this case the implementation of an intervention) this move was discussed with the researcher and agreed on an ethical standpoint. Adults stated he appeared more comfortable and vocal within this space. Due to this significant change, the findings from phase 1 cannot be attributed to the intervention alone.
- Due to this, the participating adult was no longer in the same classroom. The intervention continued as planned and was scheduled each day, however only the minimum of once per day was conducted due to logistics.
- Charlie did not receive the intervention for 5 days across the intervention phase due to sickness and staff shortages.

- Charlie's mood and wellbeing impacted the intervention, affecting his availability and engagement for the intervention and therefore outcomes. E.g., reported to be unwell on the 4/12/24.
- The key adult noted differences in interaction quality and subsequently outcomes across the intervention.
- Due to technical difficulties, some baseline measures were not videoed and relied on memory, which may impact the reliability of the data.

4.2.2 Stephen's Results

4.2.2.1 Pre and Post Measure

Table 21

Stephen's Pre and Post Measure Scores in Social Communication

	Pre	Post	Change
Joint Attention	6	24	+18
Symbol Use	23	28	+5
Social Communication	**29**	**52**	**+23**

Table 22

Stephen's Pre and Post Measure Scores in Emotional Regulation

	Pre	Post	Change
Mutual Regulation	13	13	+0
Self-Regulation	10	16	+6
Emotional Regulation	**23**	**29**	**+6**

Stephen's key adult identified a positive change in Stephen's Social Communication skills following the intervention, illustrated in Table 21. A larger increase was reported in Joint Attention (i.e., sustained and reciprocal social interaction) compared to Symbol Use. Table 22 illustrates no change was identified in Stephen's Mutual Regulation skills; however, a small increase was noted for Self-Regulation.

4.2.2.2 SCED: Communicative Methods

Figure 15 illustrates Stephen's results from Communicative Methods across the baseline and intervention phase. The results of the visual analysis are provided within Table 23.

Figure 15

A Graph to show Stephen's Scores on the Communicative Methods Subscale Across the Baseline and Intervention Phases

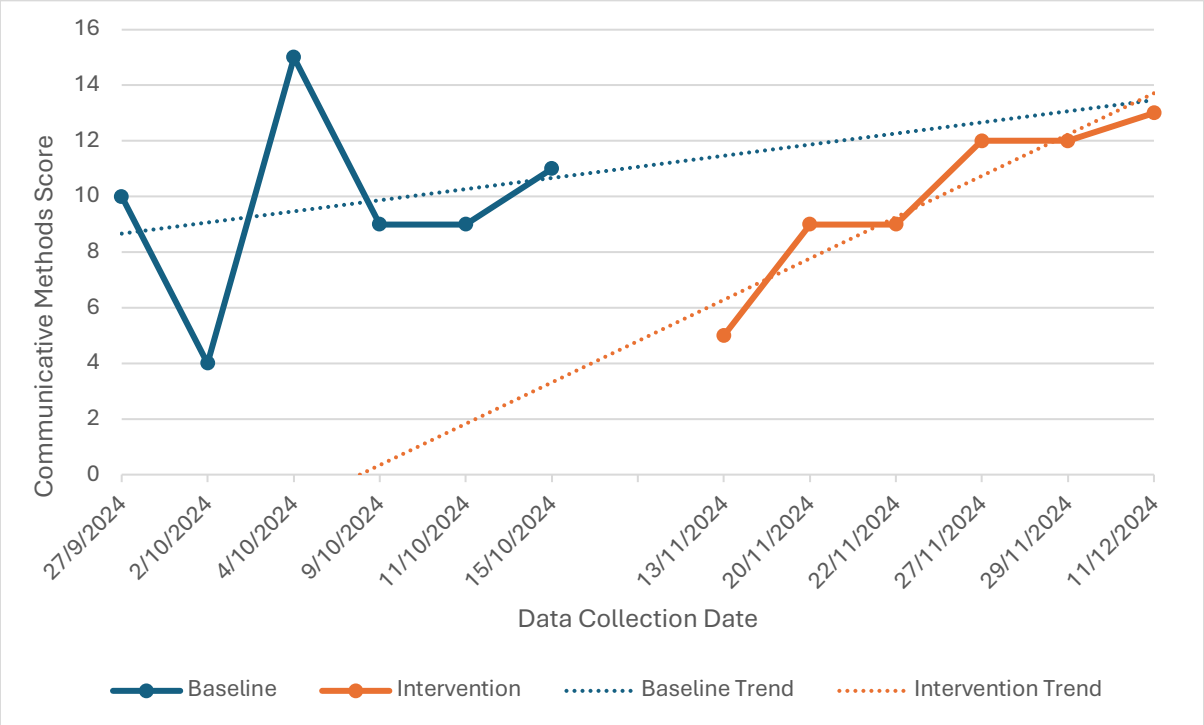


Table 23

Visual Analysis of Figure 15

Characteristic	Visual Analysis
Level	A slight increase in mean is observed from the baseline phase (9.67) to the intervention phase (10).
Trend	Both sets of trendlines have an incline, with a steeper incline observed within the intervention phase.
Variability	Graph 15 illustrates slightly greater variability in the baseline phase (SD: 3.56) comparatively to the intervention phase (SD: 2.97).
Immediacy of Effect	There is an immediate and sharp decrease seen at the outset of the intervention, before increasing to be within the same range as the final data points in the baseline.
Overlap	All the data in the intervention phase overlaps the data range in the baseline phase.

Visual analysis from the intervention phase illustrates a slow and steady increase in Communicative Methods following the implementation of Intensive Interaction, however due to the variability observed within the baseline phase and the limited data for this participant, a causal relationship cannot be interpreted.

4.2.2.3 SCED: Attention and Engagement

Figure 16 illustrates Stephen's results from Attention and Engagement across the baseline and intervention phase. The results of the visual analysis are provided within Table 24.

Figure 16

A Graph to Show Stephen's Scores on the Attention and Engagement Subscale Across the Baseline and Intervention Phases

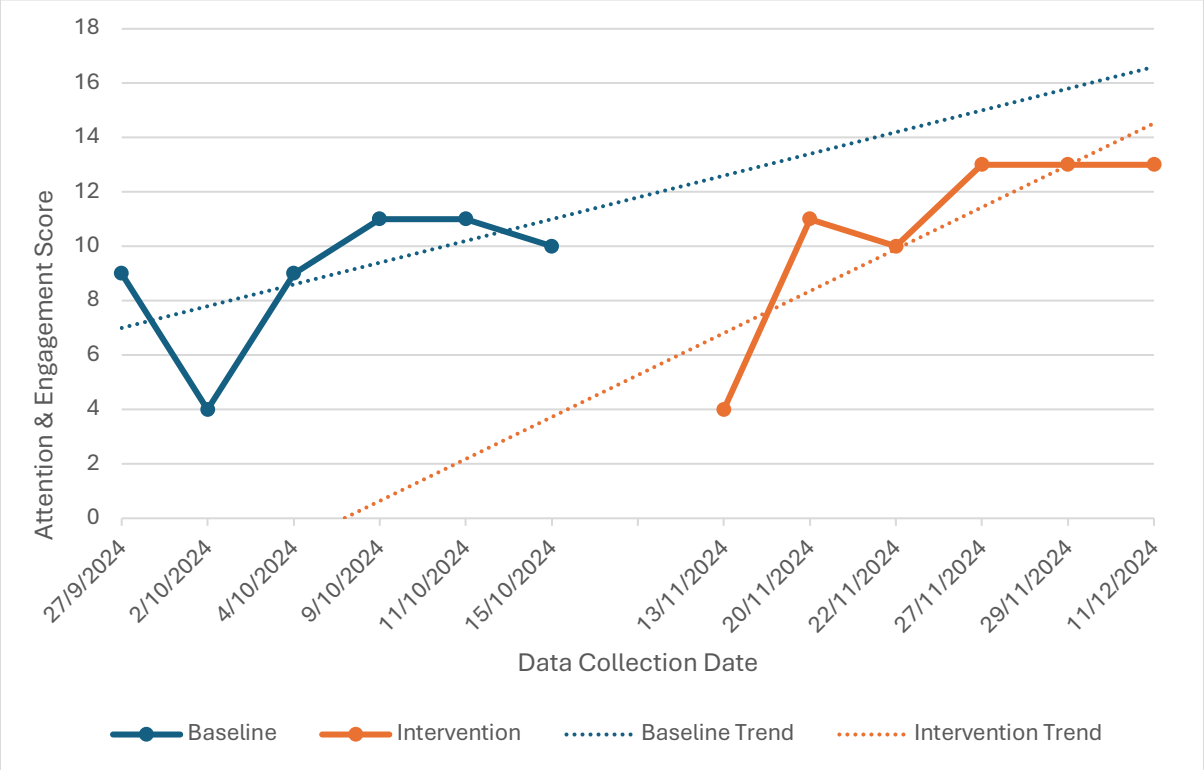


Table 24

Visual Analysis of Figure 16

Characteristic	Visual Analysis
Level	Figure 16 illustrates an increase in mean from the baseline phase (9) to the intervention phase (10.67).
Trend	Trendlines for the baseline and intervention phase have inclines, with a steeper baseline observed in the intervention phase.
Variability	Variability across both phases was low, with less variability observed within the baseline phase (SD: 2.61), compared to the intervention phase (SD: 3.5).
Immediacy of Effect	At the outset of the intervention, the data shows an immediate and sharp decrease for one data collection point. Following data points are within the range of the data at the end of the baseline phase before continuing to rise.
Overlap	Half of the data within the intervention phase overlaps the baseline phase.

Visual analysis of Figure 16 indicates a possible positive impact of the intervention on Attention and Engagement, due to the potential for some of the data being outliers from the overall trend. This should, however, be interpreted with caution due to the small amount of data collected across the phases.

4.2.2.4 SCED: Emotional Factors

Figure 17 illustrates Stephen's results from Emotional Factors across the baseline and intervention phase. The results of the visual analysis are provided within Table 25.

Figure 17

A Graph to Show Stephen's Scores on the Emotional Factors Subscale Across the Baseline and Intervention Phase

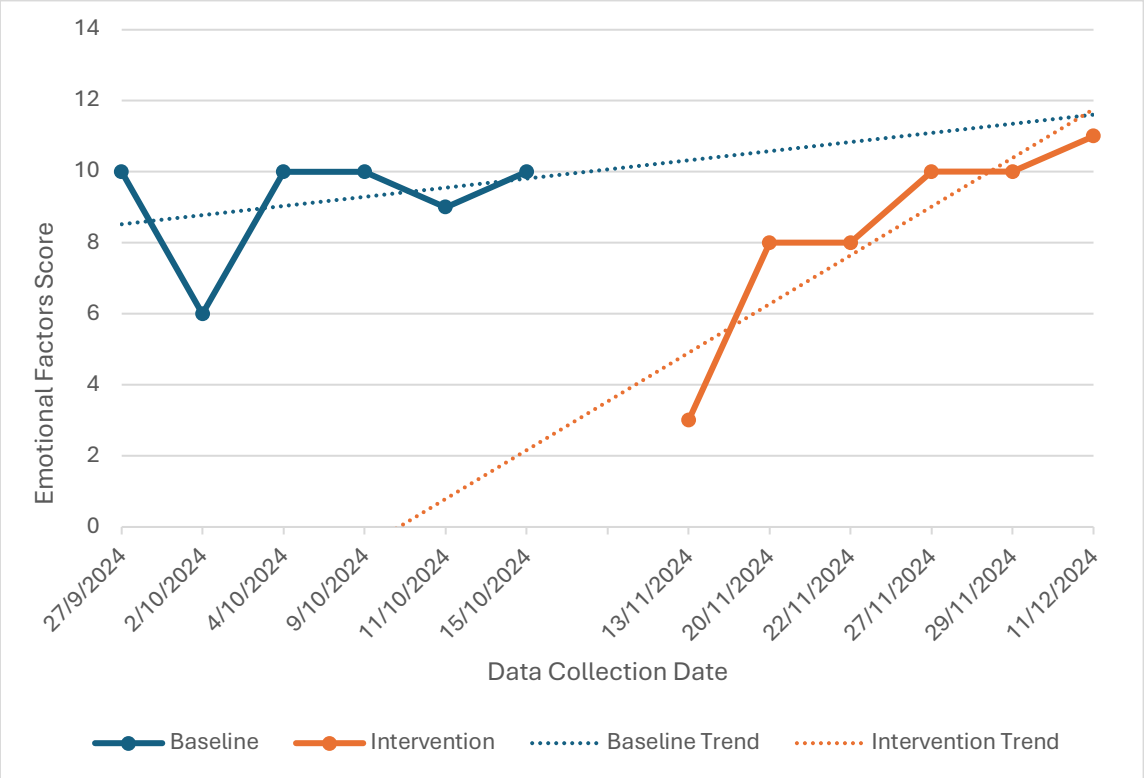


Table 25

Visual Analysis of Figure 17

Characteristic	Visual Analysis
Level	The mean decreased from the baseline phase (9.17) to the intervention phase (8.33).
Trend	The baseline trendline shows a steady incline. The intervention trendline is steeper.
Variability	Figure 17 illustrates low variability in the baseline phase (SD: 1.6), and slightly higher variability within the intervention phase (SD: 2.88), although both are close to the line of best fit.
Immediacy of Effect	The data points show an immediate decrease from the baseline to the intervention phase.
Overlap	Most of the data within the intervention phase overlaps with the data points from the baseline.

Visual analysis of this data suggests the intervention has had no impact on the Emotional Factors associated with Stephen's early communication skills.

4.2.2.5 Inter-rater Agreement

Cohen's Kappa coefficient (Cohen, 1960) was calculated to provide a measure of inter-rater agreement. The Cohen's Kappa was 0.12, which according to Landis and Koch's (1977) categories would suggest slight agreement between the key adult and the researcher. The p-value from the Cohen's Kappa calculation was 0.321 which indicates the level of agreement was not statistically significant and could therefore be due to chance.

4.2.2.6 Contextual Factors

Contextual information was gathered during data collection procedures, fidelity checks and phase 2 interviews which should be considered in relation to the reliability of the findings from phase 1. These include:

- There is a significant amount of missing data for Stephen, due to sickness, whole school events and difficulties with online data collection procedure.
- Stephen missed at least 10 days of Intensive Interaction across the intervention phase and was often unwell (e.g., 2/10/24).
- The intervention phase followed a school holiday, and it is reported Stephen can be unsettled following changes in routine.

- Initially the key adult utilised academic resources, linked to Stephen's interests, such as maths games.
- Stephen initially became "cross" in response to Intensive Interaction approaches. This reduced over time.
- During fidelity checks the key adult benefitted from support in implementing the intervention, specifically slowing down and reducing the intensity of approaches. The researcher, therefore, has some concerns around overall understanding and implementation.
- The key adult reported scepticism towards the intervention and anxiety around her capabilities to complete the intervention and research procedure.

4.2.3 Jackson's Results

4.2.3.1 Pre and Post Measure

Table 26

Jackson's Pre and Post Measure Scores in Social Communication

	Pre	Post	Change
Joint Attention	24	26	+2
Symbol Use	23	38	+15
Social Communication	**47**	**64**	**+17**

Table 27

Jackson's Pre and Post Measure Scores in Emotional Regulation

	Pre	Post	Change
Mutual Regulation	25	27	+2
Self-Regulation	18	24	+6
Emotional Regulation	**43**	**51**	**+8**

Table 26 shows a small increase in Jackson's reported Joint Attention, and a larger increase in Symbol Use, highlighting a perceived increase in Social Communication skills overall. Table 27 shows a small increase in Jackson's Emotional Regulation across both the Mutual Regulation and Self-Regulation domains.

4.2.3.2 SCED: Communicative Methods

Figure 18 illustrates Jackson's results from Communicative Methods across the baseline and intervention phase. The results of the visual analysis are provided within Table 28.

Figure 18

A Graph to Show Jackson's Scores on the Communicative Methods Subscale Across the Baseline and Intervention Phases

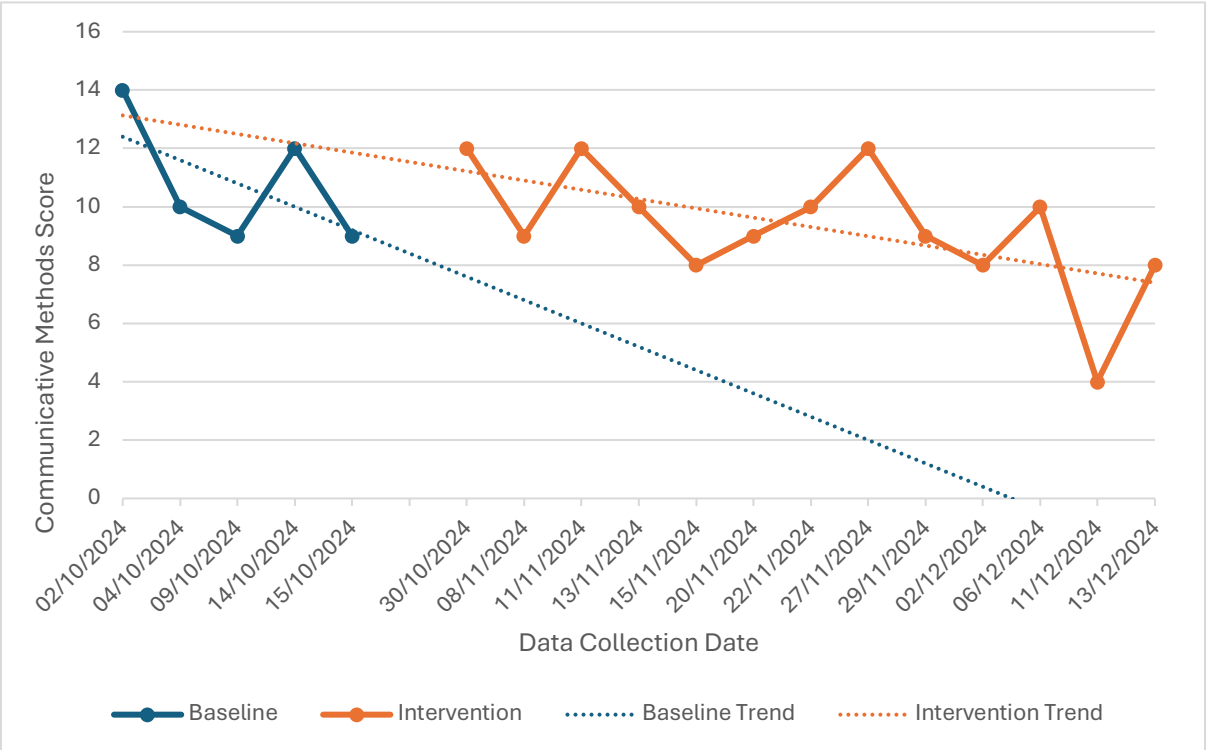


Table 28

Visual Analysis of Figure 18

Characteristic	Visual Analysis
Level	Figure 18 shows a decrease in mean scores from the baseline phase (10.8) to the intervention phase (9.31).
Trend	The trendlines for both phases show a decelerating trend, with the intervention phase trendline decreasing at a steadier rate than the baseline.
Variability	The baseline phase shows low variability (SD: 2.17), as does the intervention phase (SD: 2.18).
Immediacy of Effect	The data collected at the outset of the intervention and the end of the baseline are within the same range.
Overlap	Much of the data collected within the intervention phase overlapped with the baseline.

Visual analysis for Figure 18 is challenging due to the variability observed across both phases. Therefore, it cannot be concluded the intervention had an impact on Jackson's Communicative Methods.

4.2.3.3 SCED: Attention and Engagement

Figure 19 illustrates Jackson's results from Attention and Engagement across the baseline and intervention phase. The results of the visual analysis are provided within Table 29.

Figure 19

A Graph to Show Jackson's Scores on the Attention and Engagement Subscale Across the Baseline and Intervention Phases

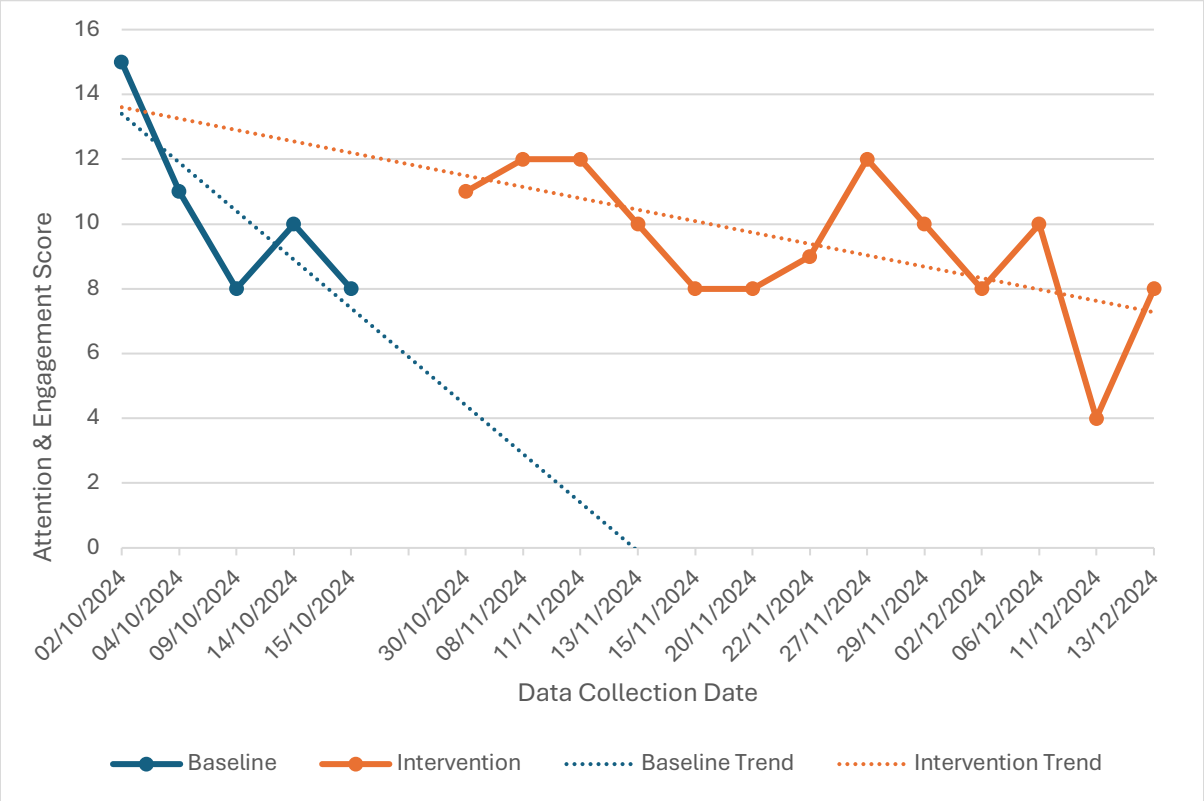


Table 29

Visual Analysis of Figure 19

Characteristic	Visual Analysis
Level	The mean decreased from the baseline phase (10.4) to the intervention phase (9.38).
Trend	The baseline trend shows a steep decline. The intervention phase trendline declines more steadily.
Variability	Figure 19 illustrates a fairly stable range of data around the line of best fit for the baseline phase (SD: 2.88) and the intervention phase (SD: 2.26).
Immediacy of Effect	The datapoints shows an immediate increase from the end of the baseline to the beginning of the intervention phase.
Overlap	All but one data point collected within the intervention phase overlapped with the baseline data.

Due to the variability and overlap in data points across the phases illustrated within Figure 19, no conclusions can be drawn regarding the interventions impact on Jackson's Attention and Engagement.

4.2.3.4 SCED: Emotional Factors

Figure 20 illustrates Jackson's results from Emotional Factors across the baseline and intervention phase. The results of the visual analysis are provided within Table 30.

Figure 20

A Graph to Show Jackson's Scores on the Emotional Factors Subscale Across the Baseline and Intervention Phases

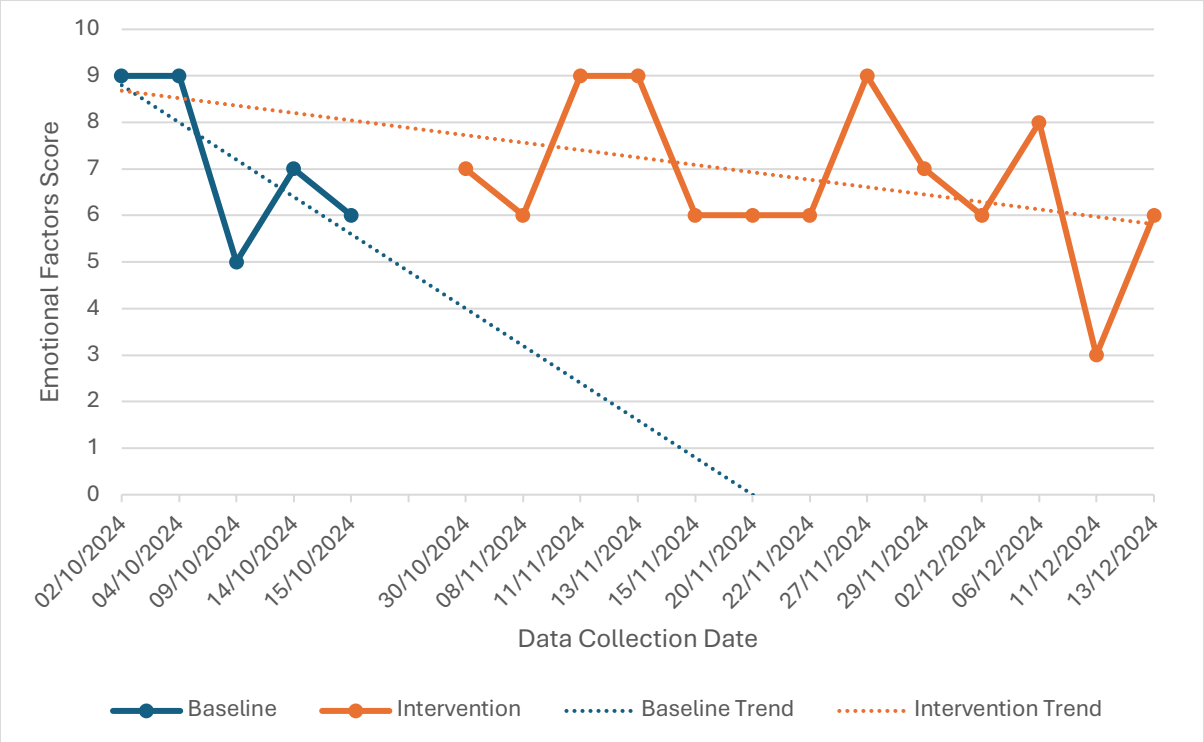


Table 30

Visual Analysis of Figure 20

Characteristic	Visual Analysis
Level	Figure 20 shows a decrease in the mean from the baseline phase (7.2) to the intervention phase (6.77).
Trend	The baseline trendline has a clear decline. The intervention phase trendline declines more steadily.
Variability	The data does not show much variation from the line of best fit across the baseline phase (SD: 1.79) and the intervention phase (SD: 1.69).
Immediacy of Effect	The datapoints at the end of the baseline phase and beginning of the intervention phase are largely similar, followed by a sharp increase.
Overlap	Figure 20 illustrates all, but one data point collected within the intervention phase overlapped with the baseline data.

The analysis of the data within Figure 20 is complicated by the variability observed across both phases of the study, no conclusions can be drawn on the interventions impact on Jackson's Emotional Factors relating to early communication development.

4.2.3.5 Inter-rater Agreement

Cohen's Kappa coefficient (Cohen, 1960) was calculated to provide a measure of inter-rater agreement. The Cohen's Kappa was 0.4, which according to Landis and Koch's (1977) categories would suggest fair agreement between the key adult and the researcher. The p-value from the Cohen's Kappa calculation was 0.773 which indicates the level of agreement was not statistically significant and could be due to chance.

4.2.3.6 Contextual Factors

Contextual information was gathered during data collection procedures, fidelity checks and phase 2 interviews which should be considered in relation to the reliability of the findings from phase 1. These include:

- Jackson missed 4 sessions of Intensive Interaction across the intervention period.
- Contextual data highlighted differences in Jackson's mood which may have impacted the data, namely being frustrated/irritable on 9/10/24 and 11/12/24

and appearing relaxed on the 27/11/24 and the 6/12/24. The key adult reported the interaction and outcomes differed each day and typically his engagement increased as he settled into the school week.

- Resources were often used, particularly focusing on Jackson's interests in books.
- Fidelity checks raised questions about the key adults understanding and implementation of the intervention, and procedural aspects associated with video recording.
- Data analysis showed a constant response pattern which appeared unusual, i.e., submitting "2" for every subscale.

4.2.4 Joshua's Results

4.2.4.1 Pre and Post Measure

Table 31

Joshua's Pre and Post Measure Scores in Social Communication

	Pre	Post	Change
Joint Attention	24	34	+10
Symbol Use	20	27	+7
Social Communication	**44**	**61**	**+17**

Table 32

Joshua's Pre and Post Measure Scores in Emotional Regulation

	Pre	Post	Change
Mutual Regulation	23	28	+5
Self-Regulation	14	21	+7
Emotional Regulation	**37**	**49**	**+12**

Table 31 shows Joshua's key adult's perception of both aspects of Social Communication increased slightly following the introduction of the intervention. Table 32 illustrates a small increase in behaviours relating to aspects of Emotional Regulation after the intervention.

4.2.4.2 SCED: Communicative Methods

Figure 21 illustrates Joshua's results from Communicative Methods across the baseline and intervention phase. The results of the visual analysis are provided within Table 33.

Figure 21

A Graph to Show Joshua's Scores on the Communicative Methods Subscale Across the Baseline and Intervention Phases

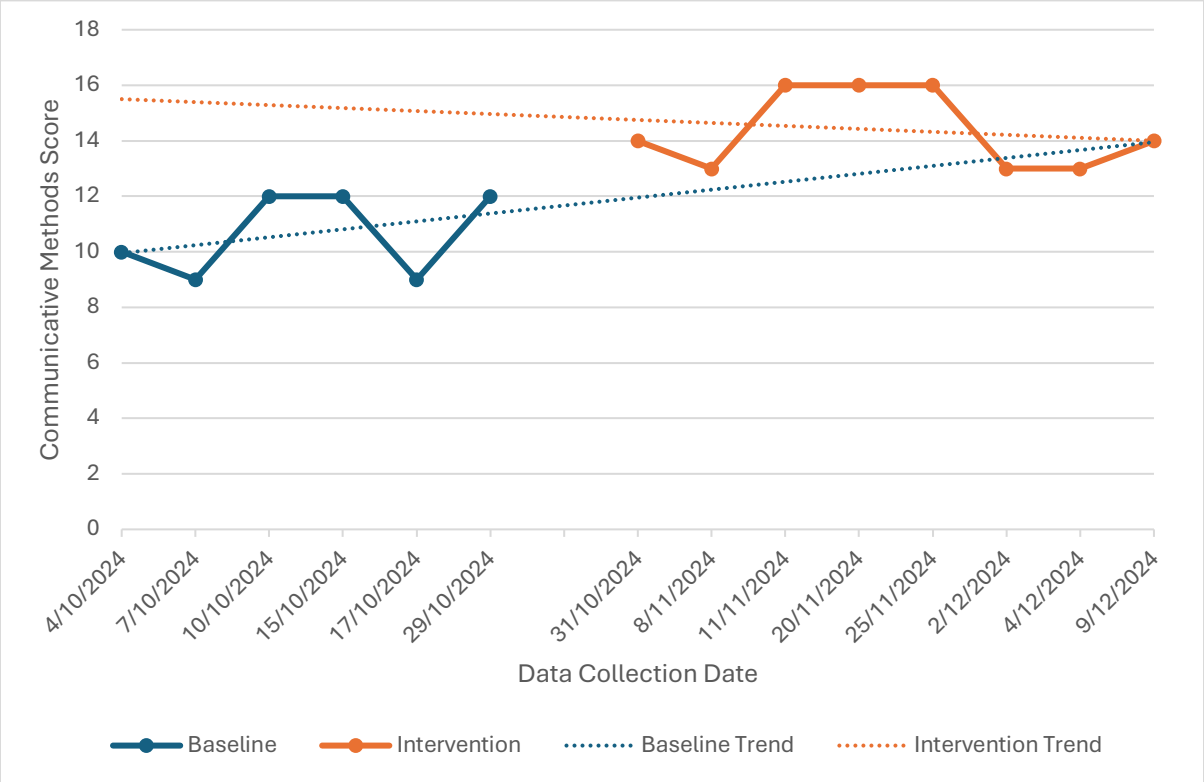


Table 33

Visual Analysis of Figure 21

Characteristic	Visual Analysis
Level	Figure 21 illustrates an increase in the mean the baseline phase (10.67) to the intervention phase (14.38).
Trend	The trendline for the baseline steadily accelerates. The intervention phase trendline declines slightly.
Variability	Both data sets show limited variability from the line of best fit. The intervention variability (SD: 1.41) was slightly smaller than the baseline variability (SD: 1.51).
Immediacy of Effect	There is an observed increase from the baseline to the intervention phase.
Overlap	There are no overlapping data points between the baseline and intervention phase.

Visual analysis suggests a vast and immediate improvement in Joshua's use of Communicative Methods following the implementation of Intensive Interaction.

4.2.4.3 SCED: Attention and Engagement

Figure 22 illustrates Joshua's results from Attention and Engagement across the baseline and intervention phase. The results of the visual analysis are provided within Table 34.

Figure 22

A Graph to Show Joshua's Scores on the Attention and Engagement Subscale Across the Baseline and Intervention Phases

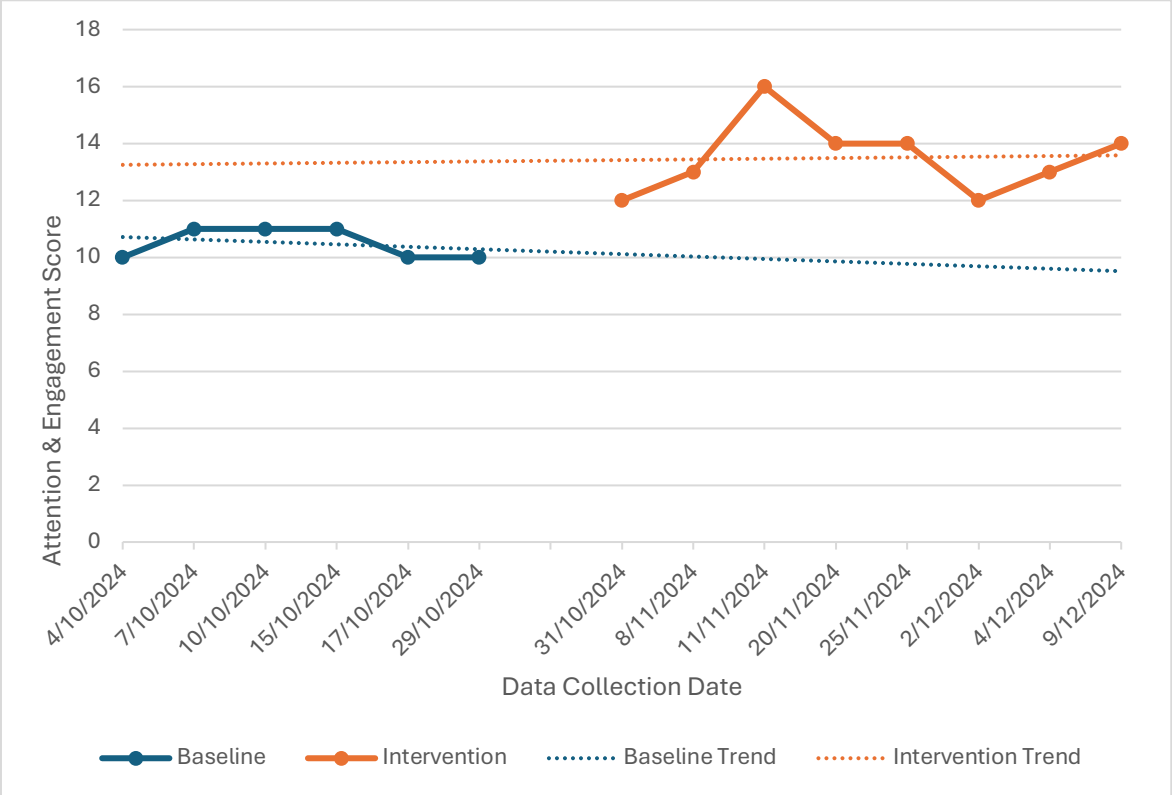


Table 34

Visual Analysis of Figure 22

Characteristic	Visual Analysis
Level	The mean increased from the baseline phase (10.5) to the intervention phase (13.5).
Trend	The baseline phase trendline declines slightly. The intervention trendline illustrates a minute incline.
Variability	Figure 22 illustrates a very small range of variability in the baseline data (SD: 0.55) and a slightly broader variation in the intervention phase (SD: 1.31).
Immediacy of Effect	Data shows an immediate and continued increase from the baseline to the intervention phase.
Overlap	The intervention data does not overlap with the data collected in the baseline.

The interpretation of these results suggest Intensive Interaction had a positive impact on Joshua's Attention and Engagement.

4.2.4.4 SCED: Emotional Factors

Figure 23 illustrates Joshua's results from Emotional Factors across the baseline and intervention phase. The results of the visual analysis are provided within Table 35.

Figure 23

A Graph to Show Joshua's Scores on the Emotional Factors Subscale Across the Baseline and Intervention Phases

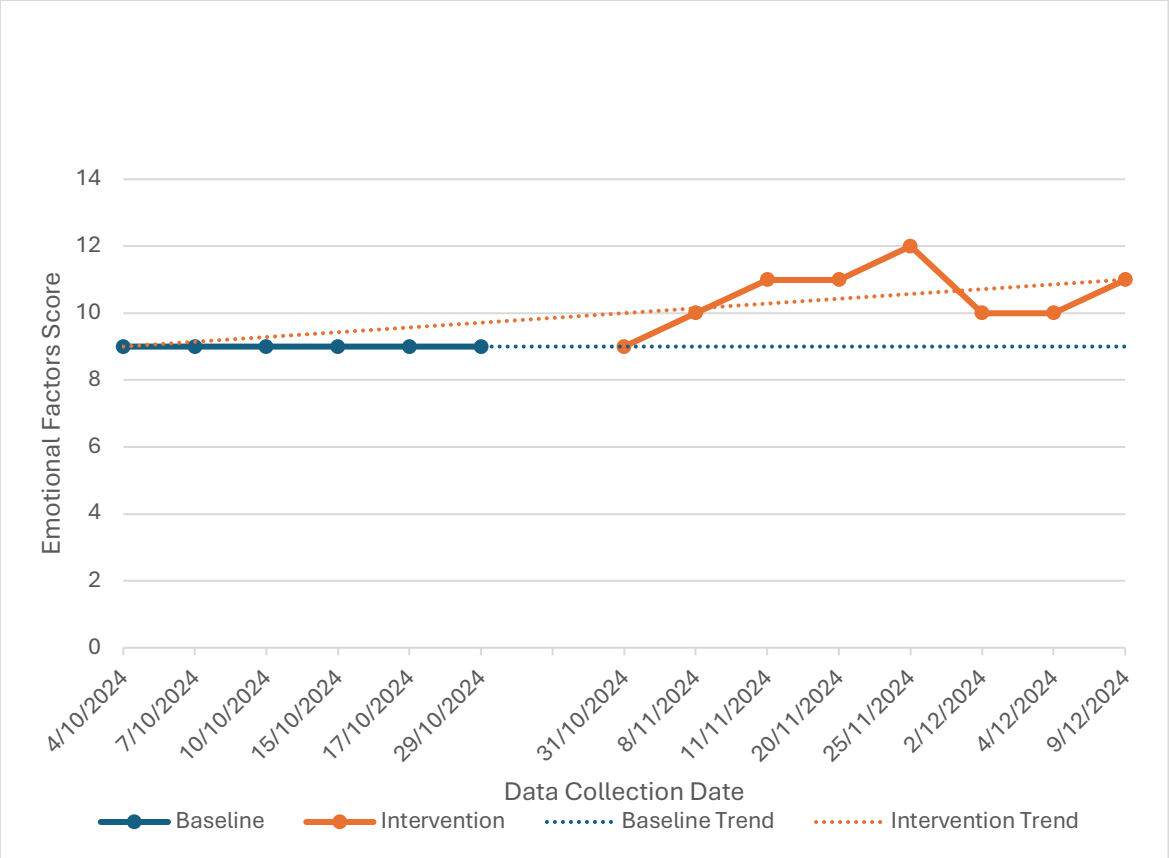


Table 35

Visual Analysis of Figure 23

Characteristic	Visual Analysis
Level	Figure 23 shows an increase in the mean from the baseline phase (9) to the intervention phase (10.5).
Trend	The baseline trendline is stable, the intervention phase illustrates a steady incline.
Variability	The baseline phase illustrates a stable range of data, in line with the line of best fit (SD: 0). The intervention phase has limited variability (SD: 0.93).
Immediacy of Effect	The beginning of the intervention phase is equal to the baseline phase; however, the data points then steadily increase.
Overlap	The initial data point in the intervention phase is the only overlap observed with the baseline phase.

These results illustrate an improvement in the Emotional Factors associated with early communication skills following the implementation of the intervention.

4.2.4.5 Inter-rater Agreement

Cohen's Kappa coefficient (Cohen, 1960) was calculated to provide a measure of inter-rater agreement. The Cohen's Kappa was 0.29, which according to Landis and Koch's (1977) categories would suggest fair agreement between the key adult and the researcher. The p-value from the Cohen's Kappa calculation was 0.077 which indicates the level of agreement was not statistically significant and could therefore be due to chance. Although three joint observations were planned, due to child and staff sickness, only one joint observation could be undertaken in the intervention phase for this pair of participants.

4.2.4.6 Contextual Factors

Contextual information was gathered during data collection procedures, fidelity checks and phase 2 interviews which should be considered in relation to the reliability of the findings from phase 1. These include:

- Across the intervention phase, Joshua missed 7 sessions.
- Joshua's mood and wellbeing (such as being tired) may have impacted the interaction, however, the key adult appeared to reflect on this and adapt approaches, ensuring Joshua's other needs were met first.

- The key adult was already encompassing a range of Intensive Interaction approaches in her natural interaction style during the baseline fidelity check.

4.2.5 Levi's Results

4.2.5.1 Pre and Post Measure

Table 36

Levi's Pre and Post Measure Scores in Social Communication

	Pre	Post	Change
Joint Attention	25	25	0
Symbol Use	19	28	+9
Social Communication	**44**	**53**	**+9**

Table 37

Levi's Pre and Post Measure Scores in Emotional Regulation

	Pre	Post	Change
Mutual Regulation	16	29	+13
Self-Regulation	19	14	-6
Emotional Regulation	**35**	**42**	**+7**

Table 36 shows Levi's key adult perceived his Use of Symbols improved following the introduction of the intervention, however there were no changes reported in his Joint Attention Skills. Table 37 illustrates the changes in aspects Emotional Regulation. The data from the post measure suggests an increase in Mutual Regulation however, a small decrease in Self-Regulation.

4.2.5.2 SCED: Communicative Methods

Figure 24 illustrates Levi's results from Communicative Methods across the baseline and intervention phase. The results of the visual analysis are provided within Table 38.

Figure 24

A Graph to Show Levi's Scores on the Communicative Methods Subscale Across the Baseline and Interventions Phases

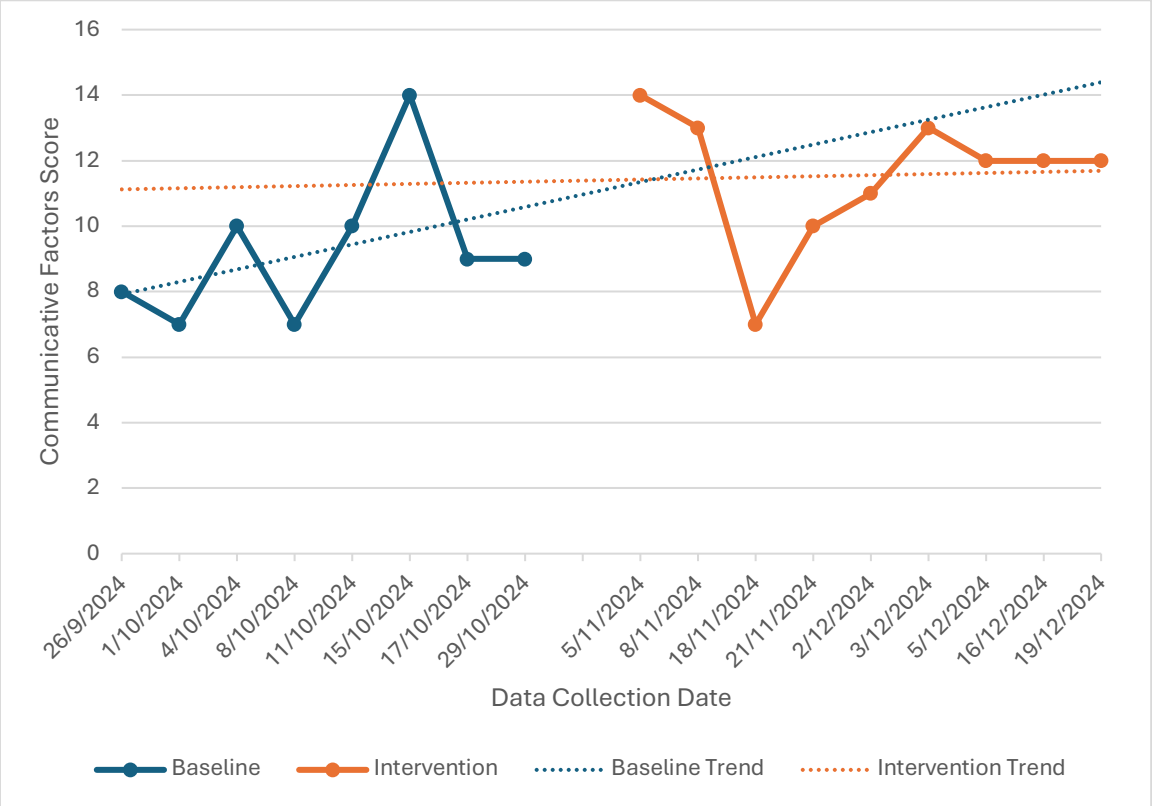


Table 38

Visual Analysis of Figure 24

Characteristic	Visual Analysis
Level	There was an increase in mean score between the baseline phase (9.25) to the intervention phase (11.56).
Trend	The trendlines for both phases incline. The incline within the baseline phase is greater than in the intervention.
Variability	Figure 24 illustrates a small range of variability across the baseline phase (SD: 2.25) and the intervention phase (SD: 2.07).
Immediacy of Effect	The graph illustrates an immediate increase from the baseline to the intervention, followed by a sharp decrease below the range of data at the end of the baseline phase.
Overlap	All the data in the intervention phase overlaps with the data collected in the baseline.

It is somewhat unclear as to whether Levi's results for Communicative Methods indicate an improvement within this area of early communication, due to the variability in data points and those which appear to be outliers from the overall trend of the data. Considering the suggestion that analysis should focus on overarching trends due to the likelihood of day-to-day fluctuation (Barlow et al., 2009), the graphical data suggests a small increase in Communicative Methods.

4.2.5.3 SCED: Attention and Engagement

Figure 25 illustrates Levi's results from Attention and Engagement across the baseline and intervention phase. The results of the visual analysis are provided within Table 39.

Figure 25

A Graph to Show Levi's Scores on the Attention and Engagement Subscale Across the Baseline and Intervention Phases

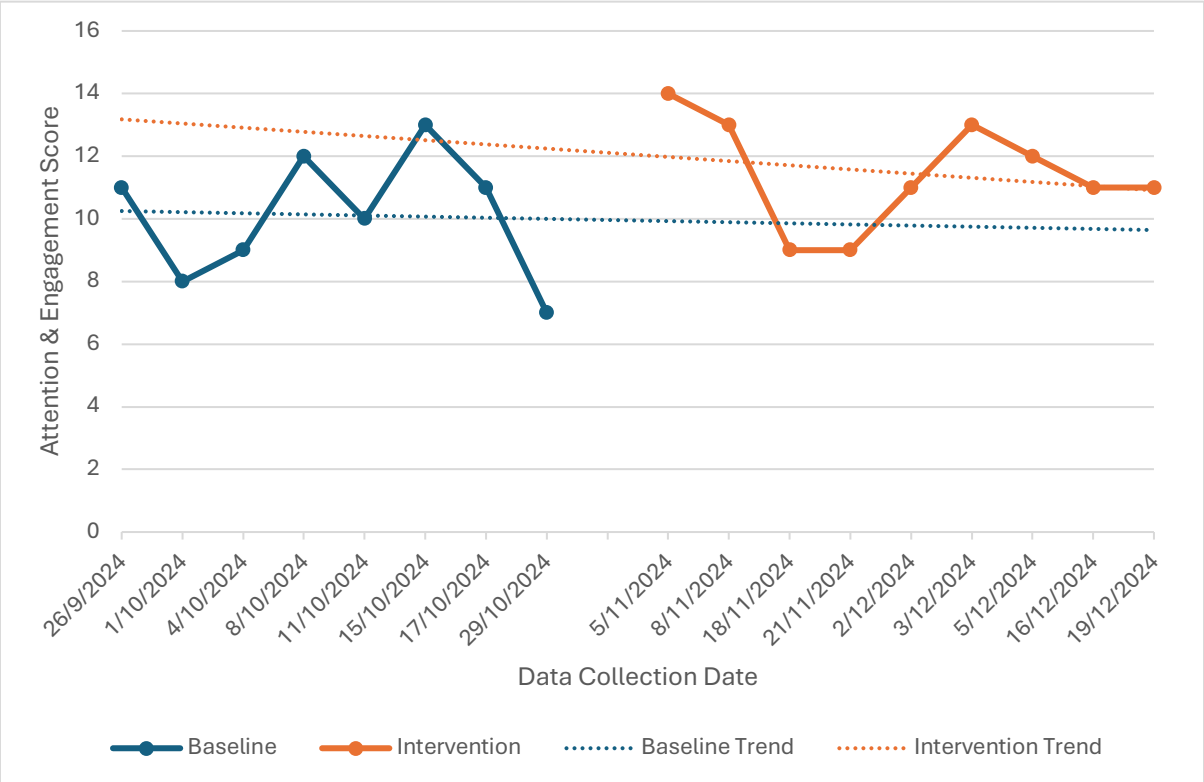


Table 39

Visual Analysis of Figure 25

Characteristic	Visual Analysis
Level	Figure 25 highlights an increase in mean from the baseline (10.12) to the intervention phase (11.44).
Trend	The trendlines for both phases are decelerating, with the intervention phase showing a slightly greater decline.
Variability	The variability observed within these data sets are small, with slightly greater variability in the baseline phase (SD: 2.03) compared to the intervention phase (SD: 1.74).
Immediacy of Effect	Figure 25 shows an immediate increase from the baseline to the intervention phase; however, this is followed by a decrease in which data points are within baseline range.
Overlap	The majority of the datapoints across both phases overlap.

Visual analysis of Levi's results for Attention and Engagement does not provide enough evidence to suggest there has been a measurable change following the implementation of the intervention.

4.2.5.4 SCED: Emotional Factors

Figure 26 illustrates Levi's results from Emotional Factors across the baseline and intervention phase. The results of the visual analysis are provided within Table 40.

Figure 26

A Graph to Show Levi's Scores on the Emotional Factors Subscale Across the Baseline and Intervention Phases

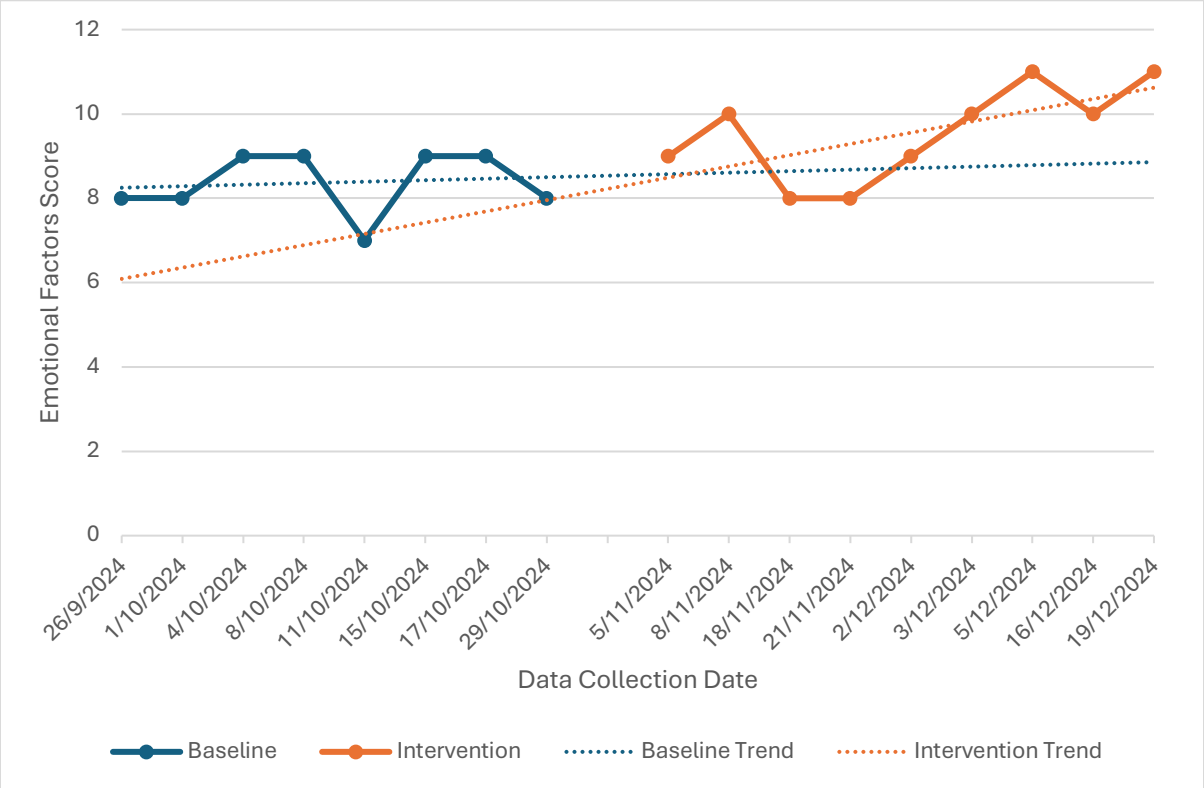


Table 40

Visual Analysis of Figure 26

Characteristic	Visual Analysis
Level	There was an increase in mean scores from the baseline phase (8.38) to the intervention phase (9.56).
Trend	The baseline phase trendline has a small incline. The intervention phase trendline also accelerates at a greater rate.
Variability	The baseline shows a fairly small variation of data from the line of best fit (SD: 0.74) with greater variability observed in the intervention phase (SD: 1.13), although this is also small.
Immediacy of Effect	The final data points in the baseline and the initial data points in the intervention phase are largely within the same range.
Overlap	Half of the data collected in the intervention phase overlaps with the data collected at the baseline.

Visual analysis suggests overall, Levi demonstrated increased skills in the Emotional Factors which are associated with early communication skills following intervention.

4.2.5.5 Inter-rater Agreement

Cohen's Kappa coefficient (Cohen, 1960) was calculated to provide a measure of inter-rater agreement. The Cohen's Kappa was 0.25, which according to Landis and Koch's (1977) categories would suggest fair agreement between the key adult and the researcher. The p-value from the Cohen's Kappa calculation was 0.063 which indicates the level of agreement was not statistically significant and could be due to chance.

4.2.5.6 Contextual Factors

Contextual information was gathered during data collection procedures, fidelity checks and phase 2 interviews which should be considered in relation to the reliability of the findings from phase 1. These include:

- 10 Intensive Interaction sessions were missed due to illness.
- Levi's wellbeing impacted engagement, particularly on the 18/11/24. Following illness/absence, Levi struggled to settle back into school and progress diminished.
- Levi had not fully settled into school and had less opportunities for Intensive Interaction due to attending part-time.
- Resources were often utilised in interactions which impacted his engagement at times.

4.2.7 Inter-rater Reliability for Visual Analysis

To reduce the possibility of subjective bias in the visual analysis stage, inter-rater agreement was sought between two analysts, see section 3.6.5. The level of agreement between the raters using Cohen's Kappa was 0.57, which according to Landis and Koch's (1977) level of agreement, indicates a moderate level of agreement. The p-value in this calculation is <0.001 indicating the observed level of agreement is statistically significant, increasing the reliability of the visual analysis judgements made by the researcher.

4.2.8 Summary of Phase 1 Findings

The initial phase of this study aimed to provide quantitative data to develop an understanding of RQ1: what are the outcomes of using Intensive Interaction on early communication skills?

Table 41 summarises the findings for each participant, showing where the intervention had an impact, indicated by changes in pre and post measure or visual analysis of the SCED data.

Table 41

A Summary of the Results for each Child Participant

	Pre and post measure	**Communicative Methods**	**Attention & Engagement**	**Emotional Factors**
***Charlie**	**Improved*	**No improvement*	**No improvement*	**Possible*
Stephen	Improved	No improvement	Possible	No improvement
Jackson	Improved	No improvement	No improvement	No improvement
Joshua	Improved	Improved	Improved	Improved
Levi	Improved	Improved	No improvement	Improved

Note. Where Charlie's data suggests improvements, this must be interpreted with caution due to changes in educational circumstance.

The pre and post measures found all key adult's perceived that the child participants had improved in their Social Communication and Emotional Regulation skills. The data suggests the intervention increased Communicative Methods for two of the five participants. Improvements were only identified for one participant in the domain of Attention and Engagement, with one participant's results appearing unclear. For Emotional Factors associated with early communication skills, two of the five participants data indicated improvements, with a further student's results highlighting possible improvements. Contextual data adds understanding to each participant's results, which will be discussed further in Chapter 5.

In section 4.3, the results from the second phase of the research study hopes to provide explanatory data that adds depth to the findings from phase 1, in addition to answering RQ's 2 and 3.

4.3 Phase 2 Findings

The qualitative phase of the research aims to provide evidence towards the following RQ's:

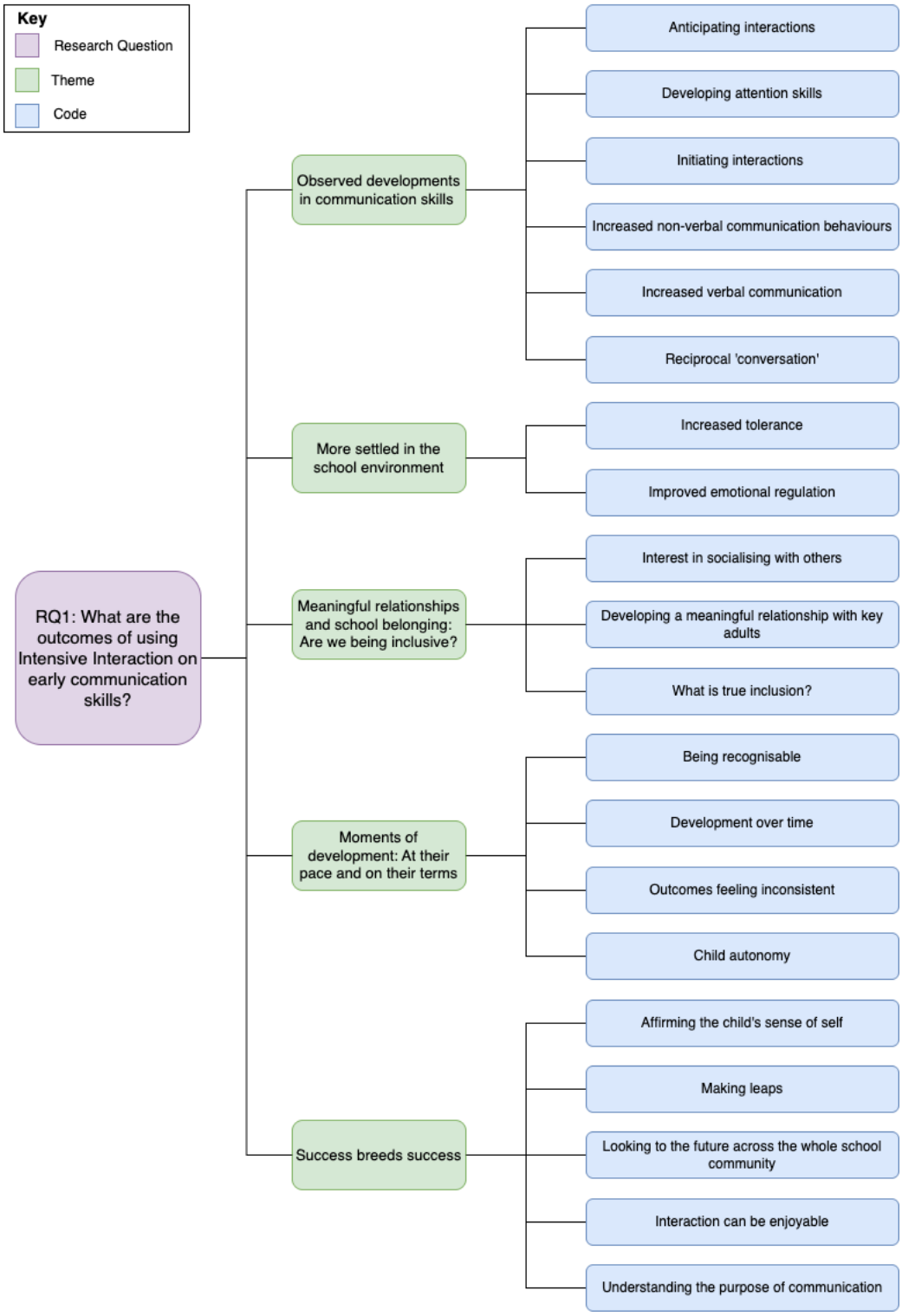
1. What are the outcomes of using Intensive Interaction on early communication skills?
2. What are teaching staff's experiences of using Intensive Interaction with young people in mainstream schools?
3. What factors are perceived to support and hinder the implementation of Intensive Interaction in mainstream schools?

4.3.1 RQ1: What are the outcomes of using Intensive Interaction on early communication skills?

The thematic map for this RQ is provided within Figure 27. Within this RTA, five main themes were constructed.

Figure 27

Thematic Map for RQ1



4.3.1.1 Theme 1: Observed developments in communication skills

When considering the impact of the intervention on communication skills, key adults described several aspects they had perceived to have improved. Although many of the children had limited language use at the time of the intervention, for some, this was reported to have developed, exemplified by increased speech and more frequent mimicking of others.

Most participants highlighted increased non-verbal communication behaviours such as increased eye contact, facial gaze and physical proximity, captured by the following, *"he'd sort of come real close to my face, literally within touching noses distance […] whereas before, he wouldn't even let me touch his hand."* (Chloe)

Children's attention skills appeared to change over the course of the intervention, as they were reported to be engaged in independent activities for longer periods, more frequently occupied in joint focus with key adults, and subsequently their interactions became longer over time.

Key adults reflected the approaches outlined within Intensive Interaction developed reciprocity within their interactions, in a way which was accessible for them both. Furthermore, several of the children began to anticipate the Intensive Interaction sessions which in some cases, further supported their ability to initiate interactions themselves, *"I would do a certain smile […] he would sort of be like, "Aha! We're going for it, we're doing it, are we?" […] he almost came to pre-empt it a little bit."* (Liz)

4.3.1.2 Theme 2: More settled in the school environment

Key adult participants talked about the impact which the intervention appeared to have had on the child's emotional regulation, highlighting improved tolerance during interactions and within the broader environment. These findings were significantly different to children's behaviours at the outset of the study, for example:

> *"He used to lash out quite a lot, he would throw his arms out and use his mouth… I thought "ooh I don't think he will let me get as close to him", but now if you saw us, we are literally like this! […] we are not seeing those meltdowns anywhere near as much as we did before […] he's settled, I'd say 80% of the time." (Chloe)*

4.3.1.3 Theme 3: Meaningful relationships and school belonging: Are we being inclusive?

For many, over the course of the research, children exhibited an increased desire to be a part of the school community, exemplified by the following:

> *"The amount of time he's spending in school is building up […] and home's experiences is he's keen to come and wanting to be in school. Whereas, to begin with, it felt very much like you were trapping a free spirit […] he comes and it's obvious he wants to be here [...] that's probably the Intensive Interaction helping with that relationship between child, place and adult."* (Ruth)

In addition to developing meaningful relationships with key adults, child participants appeared to exhibit increased interest in socialising with other staff and students within the educational setting, with the intervention specifically providing them with time together to build a connection.

Despite inclusivity being a common theme, the genuine nature of this was questioned, as often key adults worked with children alone, and separately to the rest of the class. Linked to this, some considered the impact of the intervention on neurotypical children in attendance and their interactions with children who have SC&I needs. The mixed views are illustrated in the below quotes from Anne-Marie and Liz:

> *"We'd come out […] I couldn't do that in the classroom, because the other children would have looked, and… they would have probably copied […] I wouldn't do it in the classroom. I really wouldn't, especially if you've got so many children in a class setting, with their own specific needs."*

> *"There's a few children, perhaps the ones, that are more emotionally mature […] they tended to be the ones that were asking me what I was doing […] they were trying to figure out how to interact with him, which was absolutely lovely […] I definitely think there's a way it could be adapted for peer-on-peer interactions."*

4.3.1.4 Theme 4: Moments of development: At their pace and on their terms

Perceived outcomes were mainly positive; however, this took time and for some was inconsistent. Many adults used language such as *"sometimes"* or *"occasionally"* suggesting developments were perceived to be incidental as opposed to accumulative and were dependent on external factors such as wellbeing. This could be somewhat frustrating for school staff, who want to see children make strides of development.

> *"There are odd flashes […] but then like today, he didn't want to […] some days you think oh we've really bonded, I feel like we've really connected, and then the next minute it's like, as if you're not there […] there were occasions where he was resistant […] definite days where he… disappeared?"* (Ruth)

Many described the child participants as initially avoidant or unsure of the interaction style, so, key adults benefitted from taking the time to ensure the intervention developed naturally. This was also supported by ensuring the interaction was recognisable, and in line with the child-led nature of the approach; autonomy and individual differences were prioritised.

> *"I was stepping into his bubble […] and that might be his moment of going, "Oh, what's happening? You joining?" […] It's like a way of tuning into his level […] a lot of it is led by him so you'll find a way to sort of engage his attention, on a basis he's comfortable with."* (Liz)

4.3.1.5 Theme 5: Success breeds success

When discussing outcomes, many of the key adults highlighted factors which linked to the idea of success. Significant steps of developmental progress were seen in the child participants, which were described with an element of disbelief, exemplified by the following comment, *"huge, huge jump […] he's like a different boy. He's changed so much [...] I just think, wow you have thrived."* (Chloe)

As children experienced successful interactions, they became more enjoyable and developed their understanding of the purpose of communication, whilst affirming their sense of self as with an individual voice and interaction style, *"so much of what he does […] is telling his story."* (Ruth)

Some considered how the intervention could support others within the school community and therefore acknowledged the value in sharing their knowledge of Intensive Interaction with other staff to support current students with SC&I needs and children who may attend in the future.

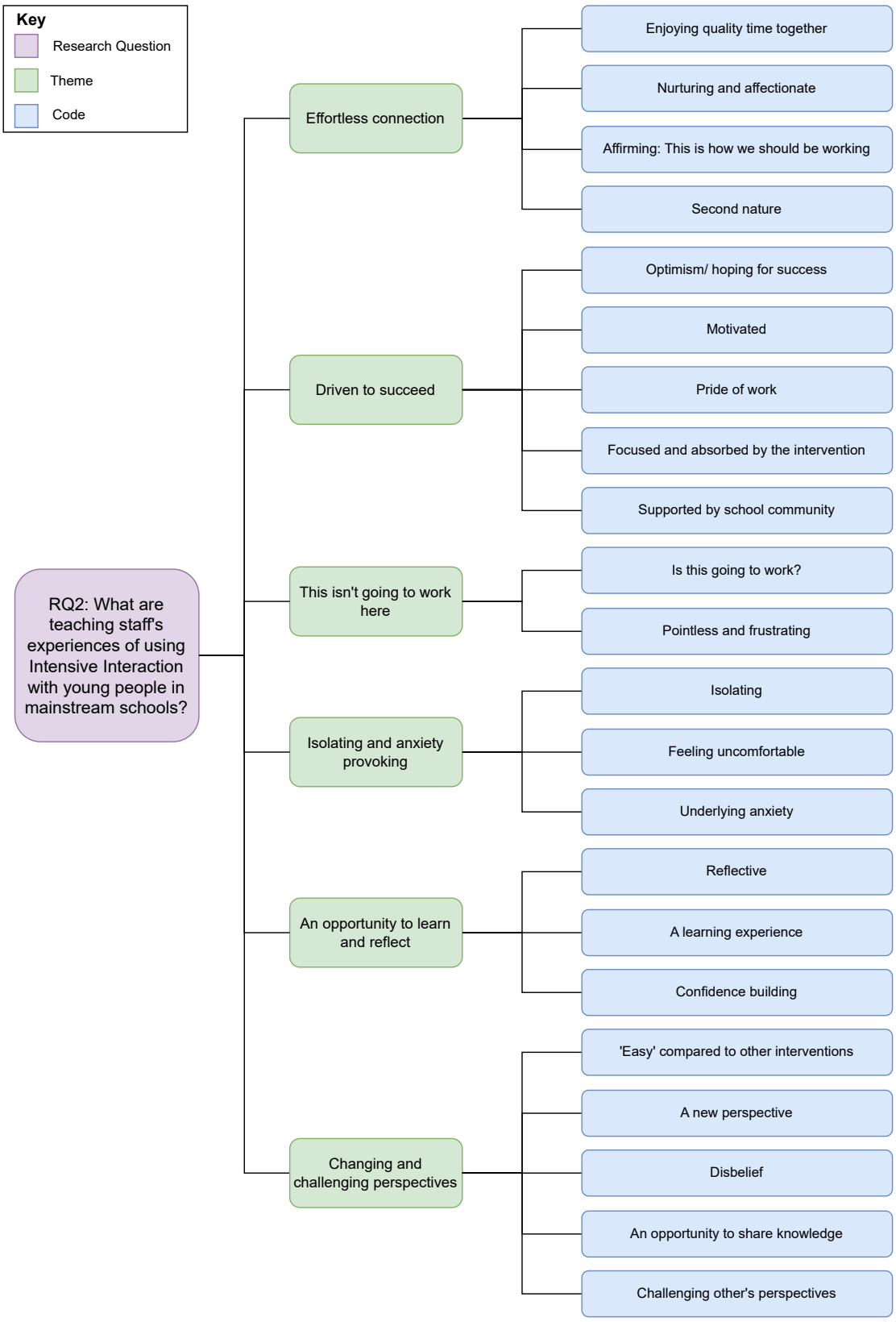
> *"That's the way forward […] more staff doing it […] for it to not so much be an intervention, as just needs to become like common practice."* (Liz)

4.3.2 RQ2: What are teaching staff's experiences of using Intensive Interaction with young people in mainstream schools?

The thematic map for this RQ is provided within Figure 28. Within this RTA, six main themes were constructed.

Figure 28

Thematic Map for RQ2



4.3.2.1 Theme 1: Effortless connection

A theme apparent across all the interviews suggested Intensive Interaction provided an opportunity to spend enjoyable quality time together. Many of the participants commented on the nurturing and affectionate nature of these interactions, *"I'd say to the other ladies […] "oh that was lovely, did you see how he touched my cheek?" […] it was nice to have that closeness, like the loving side."* (Chloe)

The intervention appeared to confirm how key adults preferred to work and interact with children with SC&I needs. Although some focused on the necessity of Intensive Interaction providing a permissive framework for this style of interaction, many of the participants reflected upon the intervention feeling natural to them and quickly becoming a 'normal' part of their day.

> *"It just seems to be the right way to be communicating with him […] obviously he's different to a lot of children […] like you wouldn't communicate with a child who is 11 the same way you would a child who is 4 […] and then we've got the autism and the communication issues, so this is how we do it!"* (Liz).

For Chloe, she appeared to consider this interaction style as part of her daily job role in supporting these students, however it is noted this was within an enhanced resource provision within the mainstream setting, *"what I would do anyway, if I was in there, the same as the other staff, is to play with them, on a one-to-one basis anyway […] it wasn't anything out of the ordinary."*

The interaction appeared to be somewhat effortless for many of the key adults, compared to other interventions or training previously delivered within the setting, due to the limited requirements involved.

4.3.2.2 Theme 2: Driven to succeed

For many of the participants, the Intensive Interaction training provided a new perspective which motivated them to implement it with the current student and consider how it could support others in the future. Participants spoke about feeling focused in delivering the intervention and optimistic about the possible outcomes. The experience of using Intensive Interaction highlighted the extent to which they

knew their student's individual needs and celebrate the steps of progress taken across the intervention.

4.3.2.3 Theme 3: This isn't going to work here

A minority appeared to have a somewhat rigid perspective on the intervention from the outset and how likely it was going to be successful within their setting and with their key child, knowing the complexity of their needs. This appeared to impact the extent to which they engaged with the intervention, *"because we are in a mainstream school and some of the intervention that you were wanting was hard to do in a classroom […] I've worked with autistic tendencies before, but not as severe as Stephen's."* (Anne-Marie)

Some of the participants experienced moments of this during the intervention phase, as they felt frustrated and disappointed by the slow progress or inconsistency of outcomes, *"It just felt […], that we were sometimes going backwards or treading water […] 'cause it did sometimes to be honest, feel like you're doing nothing."* (Ruth). This was also impacted by the open-ended nature of the intervention itself, that is less focused on specific outcomes than other interventions.

4.3.2.4 Theme 4: Isolating and anxiety provoking

A large majority of the key adults referred to the unusual nature of the interaction style during the interviews, and how this may leave them at risk of judgement from their colleagues, *"say if we started something in the corridor, I'd feel like a bit of an idiot for doing it!"* (Lydia)

Although this did not negatively impact everyone, there appeared to be a significant theme of underlying anxiety across all the participants, relating to the perspectives of others, concerns about implementing the intervention correctly and the potential for adverse effects on other students within the setting. Participants were also somewhat tentative to deliver the intervention due to their knowledge of pupils, and their potential responses to the change in communication style.

Throughout the interviews, participants reflected the need to deliver the intervention outside of the classroom in many cases, which may further isolate the child and key adult from the rest of their class.

4.3.2.5 Theme 5: An opportunity to learn and reflect

Intensive Interaction appeared to provide a learning experience for many of the key adults, as they discussed the impact which it has had on their understanding of their key child's needs and communication style as illustrated by the following comment made by Anne-Marie, *"this intervention, has helped me understand autism more*." This supported their ability to advocate for the student and develop personalised curricula that included Intensive Interaction.

The data suggested the training provided a valuable opportunity for continued professional development for some participants and acknowledge the impact which their role was having on students development. Key adults became more confident in using Intensive Interaction over time, and as this was a common discussion point across several participants, this illustrated it took time for adults to develop fluency with the approaches.

Similarly, it appeared that participants became more reflective on their Intensive Interaction sessions as they developed their understanding and were beginning to consider factors which may have supported or hindered the intervention.

> *"The timing, it wouldn't be right, so I'd have to take a step back […] if it still wasn't right, take a step back again […] it made me become more aware of the way I interact with him […] and the environment he's in as well."* (Lydia)

4.3.2.6 Theme 6: Changing and challenging perspectives

Taking part in the intervention provided a fresh approach to working with children with SC&I needs and many key adults shared feelings of disbelief at the ease of the intervention and the impact which it had on the children.

Despite this, some of the participants thoughts on the intervention were somewhat conflicting. For example, despite seeing positive outcomes, Intensive Interaction challenged their understanding of the activities which schools typically prioritise.

> *"Working at the child's pace… […] it's an alien concept. Because a school has so many deadlines and targets you're working towards to not have that structure can be quite scary […] I know some of my colleagues found it very… well we should be, we could be doing this and this. But actually, is that going to get any further, any quicker for Levi with his engagement in school? No."* (Ruth)

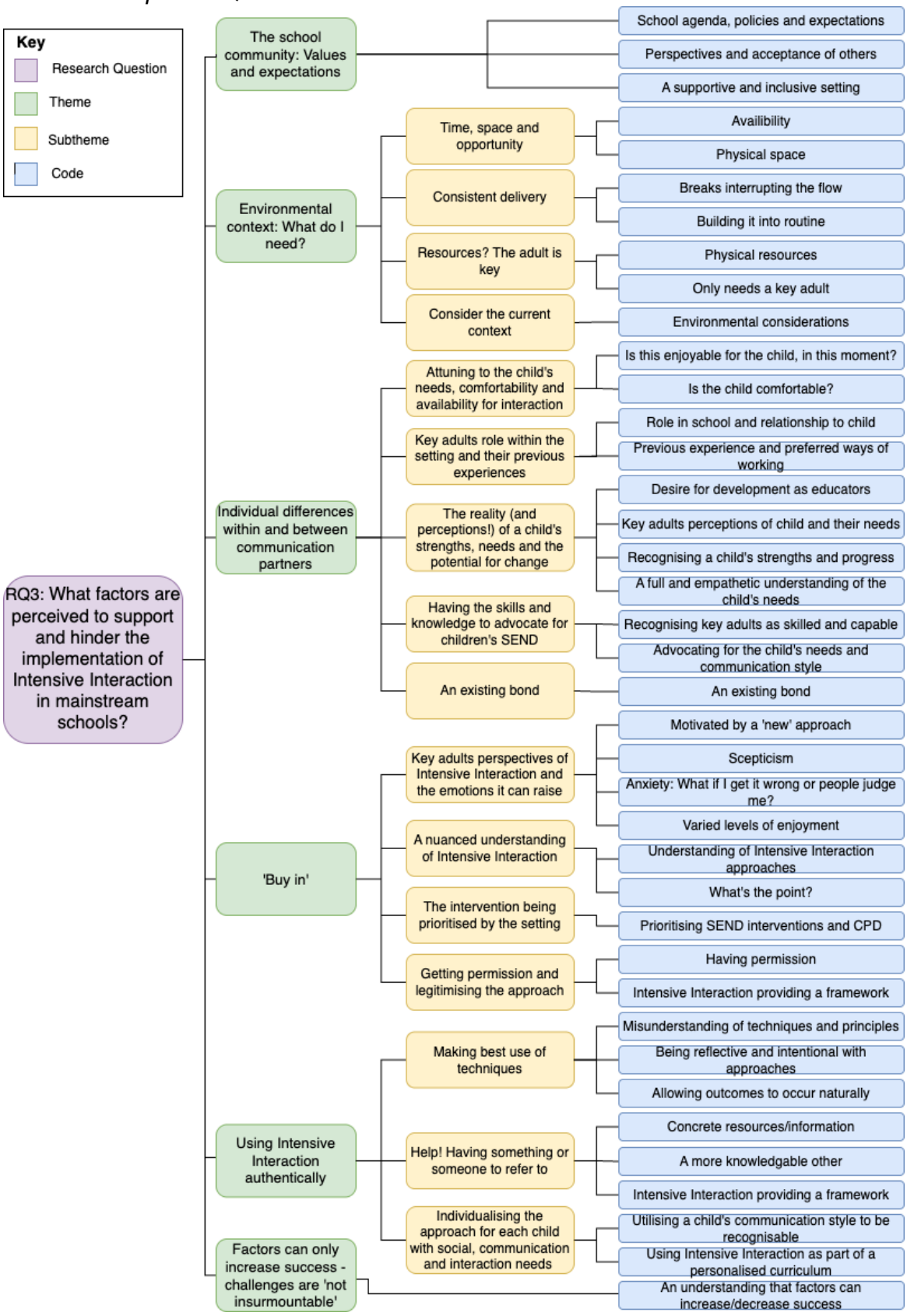
Alongside the key adults own perspectives, taking part in the research project also provided an opportunity for them to challenge their colleagues perceptions, encouraging them to be receptive to the intervention and subsequently benefit from using Intensive Interaction themselves. In this way, key adults participation in the research led to informal training of other staff.

4.3.3 RQ3: What factors are perceived to support and hinder the implementation of Intensive Interaction in mainstream schools?

The thematic map for this RQ is provided within Figure 29. Within this RTA six main themes and a further sixteen subthemes were constructed.

Figure 29

Thematic Map for RQ3



4.3.3.1 Theme 1: The school community: Values and expectations

A theme which was apparent throughout the interviews with key adults related to the wider school context. Several participants raised concerns around the schools agenda which may impact the implementation of the intervention. For some, this revolved around the idea that children should be focused on academic learning, or simply the fact the intervention was taking place within a *"mainstream school",* and it may not align with the typical expectations of the setting. For example, the Intensive Interaction techniques, particularly physical contact and proximity may challenge the typical policies of working within mainstream education.

> *"In the back of my head, I'm like school. Primary school. Mainstream primary school […] but after doing the training, that put that into perspective […] him seeking out physical contact – that's communication as well […] if he needs to go cheek-to-cheek with me, then I'm gonna allow it."* (Liz)

A minority of the participants also raised concerns about how the intervention may impact the learning of other students and suggested they should perhaps focus on delivering a typical curriculum for the participating child, highlighted by the following:

> *"It would have been very hard for them to concentrate if I was doing it with Stephen […] they sit on the carpet, so Stephen should sit on the carpet. He's in a mainstream school; we want him to learn."* (Anne-Marie)

Others reflected on the inclusive nature of their settings and how this supported the use of Intensive Interaction, as the individual differences of the whole school community were celebrated, and the professional judgements of key adults were respected and valued.

A significant factor within the school community which impacted implementation relates to colleagues negative perspectives of Intensive Interaction. For many key adults, there were concerns around looking 'silly', leading to a pressure to explain the intervention and legitimise it to others.

> *"I'd feel like a bit of an idiot for doing it! […] but now I know it's OK […] without people walking past going "What <u>is</u> she doing?" […] "should you be doing that? […] don't you feel like you're taking the mickey out of him?" […] I said, "It's part of Intensive Interaction, it's fine"."* (Lydia)

4.3.3.2 Theme 2: Environmental context: What do I need?

More specific to in the moment intervention delivery, this theme considers the immediate context that supports Intensive Interaction sessions with subthemes highlighting the importance of time and space, considering the busyness of the environment, consistent delivery and questions the use of resources.

Time, space and opportunity

Intensive Interaction provided an opportunity for pairs of participants to interact with one another. The importance of protecting this time was highlighted, and additionally, the typical routines which may impact that were considered, such as staff availability, whole school events or simply having the physical space to fully engage in the interaction within small settings.

Consider the current context

The specific context of the environment was raised by all participants. Factors which needed to be considered during Intensive Interaction sessions were related to the overall busyness of the space and aspects relating to the class schedule, such as whether other students were engaging in adult-directed activities or free flow learning. Despite this, many celebrated the adaptability of the intervention which allowed it to be undertaken 'ad-hoc'. Of significance, both communication partners needed to be able to focus on the interaction without becoming distracted.

Consistent delivery

Several key adults referred to the impact which breaks in intervention delivery negatively impacted the flow and routine, subsequently hypothesising this may have had an impact on children's outcomes. This perspective aligns with other comments which highlighted the importance of building Intensive Interaction into the child's routine.

Resources? The adult is key

Across the participants a variety of resources and activities were used when engaging in Intensive Interaction with their key child. Pertinently, many prioritised joining the child and recognised the intervention could be completed with no resources at all – apart from the key adult themselves.

Despite this, some participants benefitted from using resources to either support the child's engagement, or to ensure completing the intervention aligned with their own perspectives of how they should be interacting with the child. For one key adult, this appeared somewhat outcome driven e.g., using curriculum themed resources, and for another, the child's interest in resources impacted their ability to engage with the intervention, *"he would become so hyper focused on what was in front of him, that you know, you cease to exist."* (Ruth)

4.3.3.3 Theme 3: 'Buy In'

An important factor which appeared to impact the implementation was that of 'Buy In', evident at an individual level for key adults facilitating the approach, and more broadly to the extent the educational setting valued and prioritised interventions supporting SEND.

A nuanced understanding of Intensive Interaction

There was a varied understanding of Intensive Interaction across participants. Some appeared to fully encompass the philosophy of the approach, as it aligned with their values and preferred ways of working. Others were more sceptical, and it appeared a few participants misunderstood the techniques associated with Intensive Interaction.

The approach was somewhat frustrating for a few participants, as although there was an understanding of its evidence-base, the ambivalence of outcomes and next steps were questioned, *"I suppose the only thing it did bring up is I wonder what this would look like if we carry on in six months' time or in a year's time? How will it develop?"* (Ruth)

Getting permission and legitimising the approach

Training in Intensive Interaction techniques appeared to provide key adults a framework to develop their interactions with students with SC&I needs, and for some, this confirmed a way of working with SEND children that aligned with their personal values and experiences.

For a minority, it appeared to be important that this training came from an external professional, as Lydia stated, *"It's fine, trust me, Educational Psychologist says I can do it!"* This suggested EP guidance legitimised the approach and gave key adults permission to communicate with these students in a way which is recognisable to them.

Key adult's perspective of Intensive Interaction and the emotions it can raise

Intensive Interaction evoked a range of feelings for the participating key adults. For some, the approach motivated and interested them, providing a new perspective in supporting students at the early stages of communication. Many reflected the interaction sessions had been enjoyable and spoke about the sessions and outcomes for the children with pride.

In contrast, several of the participants were sceptical about the intervention, its ability to support the students in mind, or the likelihood of its success in a mainstream setting. Many also felt anxious about potentially delivering Intensive Interaction incorrectly or being judged by colleagues unaware of the interventions purpose.

The intervention being prioritised by the setting

From a whole school perspective, being situated within an educational setting that values CPD and prioritises interventions for SEND supported implementation, *"the support here in school […] you know this intervention is happening, Liz is doing it every day with him."* (Liz)

4.3.3.4 Theme 4: Individual differences within and between communication partners

The characteristics of participants appeared to be a factor which influenced the success of implementation. Much of this theme focuses on the personal and professional characteristics of the key adult, however, also considers their perceptions of the child's needs and the relationship between them.

An existing bond

Participants identified it was important to have a pre-existing and trusted bond with the child to support them in readily accepting the interaction style. Furthermore, the approach was described to deepen prior relationships.

"I think if I was somebody who didn't know Joshua […] and he didn't know me, it wouldn't have been half as successful." (Liz)

Attuning to the child's needs, comfortability and availability for interaction

Key adults emphasised the importance of the child's wellbeing; ensuring their basic needs were met and they appeared regulated and comfortable within the setting prior to interaction. Without this in place, they recognised the interaction was likely to be unsuccessful.

The overall enjoyment of the interaction was also raised as a topic for consideration, with remarks suggesting key adults were concerned about the extent to which students would allow them to join in. It appeared the intervention felt intrusive or unwanted at times, although most participants reported it to be enjoyable for both communication partners at the conclusion of the research, *"the more and more as we did it, I think he understood […] I wasn't going to hurt him […] I wasn't bringing anything to him, but joy."* (Chloe)

Due to the above factors, key adults facilitating the intervention benefitted adapting their approach according to the child's presentation.

The reality (and perceptions!) of a child's strengths, needs and the potential for change

Relating to the previous subtheme, key adults discussed the importance of having a nuanced understanding of a child's needs. This supported them to reflect on interaction availability and develop their understanding of the child's communication style using the children's unique strengths to support their development. Liz reflected on her own neurodivergence and how this provided a unique perspective on Joshua's needs which her colleagues may not have:

"I've got autism and ADHD […] I don't know whether I just found it easy to tune into him […] to see if from a different angle […] one of my strengths within my role is I can empathise […] I can relate."

Several participants raised concerns about the significance and complexity of student's needs. Their perceptions appeared to impact the extent to which they

believed the intervention would be successful, despite desiring to see developmental progress, likely linked to their role as educational professionals.

> *"I'm always up for a challenge, but at the beginning I thought, I don't know how we're gonna do this […] Like I've never taught a child like him before, with as high a needs as what he's got."* (Chloe)

Key adults roles within the setting and previous experiences

Many participating adults were working individually with a key child throughout the school day, providing ample opportunities to complete the intervention autonomously, however suggested this could be isolating.

One participant, Chloe, was a general classroom TA, and as her student moved to an enhanced resource unit during the research, the researcher questioned the impact this had on daily intervention. Interestingly, this provided protected time, as it reduced the likelihood of Chloe being pulled away to other pressures.

> *"In the classroom with all the others, the other children are all wanting me, so I wouldn't have been able to solely focus on doing that interaction. […] probably was easier for me, knowing it's in a different room. Whereas I think in the classroom, I'd probably be like, I'll do it in 5 minutes, and then you get carried away…"*

Several adults drew upon their previous experiences when discussing the approach, suggesting it would align with professionals with experience working within EYFS or SEND settings. Furthermore, personal characteristics of communication partners were considered, including levels of confidence (which have previously been discussed) and preferred ways of working.

> *"It feels so open-ended, you're not feeling like you're ticking boxes, you're feeling like you're on a journey […] It was fine for me… I'm quite happy to operate without an agenda […] Some people are task orientated, and I don't think Intensive Interaction is a task orientated project, it's a child focused project."* (Ruth)

Having the skills and knowledge to advocate for children's SEND

It was important key adults felt confident in their abilities and recognised the value which their actions were having on a child's development. Understandably, confidence levels varied, and those who reported self-doubt appeared less engaged with the intervention. Another supportive factor was the extent to which colleagues recognised key adults' skills and trusted their professional judgement. This further increased adults' confidence in advocating for SEND pupils.

4.3.3.5 Theme 5: Using Intensive Interaction authentically

This theme considered the intervention integrity and the degree to which it was individualised and recognisable for each child. Participants outlined strategies which they felt supported them in delivering the intervention correctly.

Making best use of specific techniques

Participants broadly considered key approaches associated with Intensive Interaction. Many focused on the importance of being reflective and intentional with chosen techniques and not forcing outcomes, *"you have to let go of the agenda, and you have to just focus on the moment with the child."* (Ruth) Despite the training, several participants appeared to misunderstand the overarching aim of Intensive Interaction and some specific techniques.

Help! Having something or someone to refer to

Alongside the perspective that Intensive Interaction can provide key adults with a framework for interacting with children who have SC&I needs, many participating adults referred to concrete resources that would likely support intervention delivery. This included support from a more knowledgeable and experienced other, training notes and videos to reduce the abstract nature of the approach.

Individualising the approach for each child with social, communication and interaction needs

Many participants recognised Intensive Interaction is not a 'stand-alone' and valued implementing it alongside other interventions and adjustments as part of a personalised curriculum. An emphasis was placed upon utilising preferences or interests to ensure the communication was recognisable to the child, "*he just sort of*

looks at me as if to say, "you know what I mean!" He just gives me a look, as if to say, "yeah, you understand"". (Chloe)

4.3.3.6 Theme 6: Factors can only increase success – challenges are 'not insurmountable'

Although specifics were perceived to support or hinder the interventions success, several participants believed these factors were not a 'catch-all'. The presence of these factors was presented to increase success and subsequent outcomes for children, as opposed to meaning the intervention was impossible without them.

> *"I think it would still work! But I just think, the higher success rate would be for that already existing bond to be used."* (Liz)

> *"We'd try our best to do where the class were, […] and sometimes that would work and sometimes it really wouldn't work. It was those kinds of challenges, but not insurmountable […] it will adapt to the challenge."* (Ruth)

4.3.4 Summary of Phase 2 Findings

In summary, the use of Intensive Interaction within mainstream schools led to a range of observable outcomes for individual students with SC&I needs and provided an opportunity for professional development for key adults. Perceptions of working with children with SC&I needs were challenged and the study improved advocacy for this population. The experiences of the participating adults differed vastly, and the individual differences of each set of participants and their specific educational context impacted the overall success of the intervention. The discussion section will now consider these findings in relation to existing literature and psychological theory.

5. Discussion

5.1 Introduction to Chapter

This chapter begins by providing a summary of the findings relating to each RQ, referring to the literature discussed within Chapter 2. Although SCED's were utilised due to the heterogeneity of the population of interest, the current study is concerned with broad findings across participants. Therefore, specifically in relation to RQ1, overall outcomes will be summarised. Strengths and limitations of the research, alongside ethical considerations are highlighted before considering the implications of the findings for a variety of stakeholders. The chapter concludes by presenting key findings and unique contributions.

5.2 Key Findings in Relation to each Research Question

5.2.1 RQ1: What are the Outcomes of Using Intensive Interaction on Early Communication Skills?

The quantitative data illustrated two of the five participants increased their use of Communicative Methods during the intervention phase and Emotional Factors associated with early communication skills. One participant's data indicated an increase in Attention and Engagement skills during the intervention phase. Pre and post triangulation measures showed that key adults perceived all children had improved their Social Communication and Emotional Regulation skills.

The inconclusive nature of the quantitative data may have been impacted by a variety of factors, which will be discussed throughout this chapter, including child illness, key adults misunderstanding the intervention techniques and having limited belief in their abilities, in addition to concerns relating to the repeated measure. There are some contrasts between the quantitative and qualitative findings as interview data suggests significant outcomes were observed across participants. The rationale for utilising a mixed methodology was to consider outcomes which may have not been directly measured by the SCED, and therefore, outcomes identified across both phases of the research will now be discussed more broadly.

Qualitative data suggested that developments were incidental, often on the child's terms and at their pace, which may explain the inconsistencies observed within the quantitative phase. This is likely linked to the heterogeneity of the population's needs and preferences (Ambitious About Autism, 2022), however alternative explanations have been considered. The literature surrounding the topic of autism highlights the alternative methods of communication utilised by the population (Trevarthen & Delafield-Butt, 2013; Ephraim, 1998), which means the repeated measure in the SCED may have focused on unsuitable communication behaviours. Furthermore, the Dual Process Model (Firth, 2009) (Figure 2), postulates development to be rapid at the outset of Intensive Interaction before developing more gradually, which may explain the variation seen within the measurable data and pre-empts trends were likely to change across the intervention phase. Considering this and previous findings in the topic (Kellet, 2000; Argyropoulou & Papoudi, 2021), outcomes may have progressed, had the intervention been used for a longer period.

Synonymous with previous literature, the current findings highlighted perceived improvements in skills which are typically associated with early communication, such as eye contact and vocalisations (Kellett, 2000; Argyropoulou & Papoudi, 2012; Mourière & Scott-Roberts, 2017; Mourière & Hewett, 2021). From a developmental perspective, the improvements seen in early communication may explain observed improvements in more advanced communicative behaviours such as increased attention and expressive language, reiterating the findings of Mourière and Hewett, (2021) and reflecting the trajectory of communication development illustrated within Figure 1 (Chapter 2, pg. 20). Broadly, the findings of the current study suggest improvements across the FoC (Hewett, 2023), which underpin Intensive Interaction.

Many children appeared more motivated and interested in social interaction, in line with previous research (Kellett, 2000). However, the suggestion that their interest increased opposes Jaswal and Aktar's (2019) view that individuals with SC&I needs are not uninterested in socialisation, their interaction style is simply different and uses alternative methods. Considering the concept of intersubjectivity (Trevarthen & Aitken, 2001) discussed within Chapter 2, perhaps participants had not experienced successful pseudo dialogues (Schaffer, 1984) in the setting before, and as key adults began to treat all behaviours as communicative, this influenced the intersubjectivity

between the pair. In this way, the child would have likely developed an understanding of the function of communication and subjectivity in their actions, whilst the key adult developed their understanding of the child's communication style, leading to more success overall.

A key finding relates to the extent of which the intervention appeared to influence Emotional Factors associated with early communication skills, supporting the importance of connection in line with the FoC (Hewett, 2012; Hewett, 2023). As postulated by Ephraim (1982), the relationship between emotional security and successful communication is bidirectional, reiterating the arguments around Intensive Interaction providing an opportunity to develop intersubjectivity with a trusted adult (Caldwell, 2006), and the links which the approach has to Attachment Theory (Bowlby, 1969). The findings from the current study indicate the approach supported the development of trusting and secure relationships within the setting, in line with previous research (Mourière & Hewett, 2021; Bhogal, 2022).

Relatedly, the current study highlighted improvements in the emotional regulation of the participants and a decrease in behaviours that challenge, which supports previous literature (Bhogal, 2022; Mourière & Hewett, 2021; Argyropoulou & Papoudi, 2012; Tee & Reed, 2017). Whilst it is likely this is linked to Intensive Interaction providing a framework which legitimises a student's communicative behaviours, the researcher questions the extent to which the intervention moreover developed the key adult's understanding of children's communication styles, leading to more frequent success. This highlights the role of the adult in facilitating interaction, in line with theoretical standpoints noting the development of communication does not occur in a vacuum and requires two or more individuals to be effective (Anderson, 2004).

Intensive Interaction emphasises utilising an individual's behaviours as a guide (Nind & Hewett, 2005), however, participants were unlikely to be consistently available for interaction, particularly if basic needs were not met, impacting several participants due to illness. Additionally, previous research suggests students exhibited skill regression when the intervention ceased, (Argyropoulou & Papoudi, 2012), suggesting findings in the current study were impacted by absences, discussed in

section 5.3.2. Considering human necessity for basic needs to be met, this reiterates the importance of tuning in to the affective state of learners (Caldwell, 2013).

Although not the aim of the current study, the broader impact of Intensive Interaction was discussed, including the opportunity to support other students early communication skills. Considering the prevalence of SEND (Office of National Statistics, 2024a), this is key. Intensive Interaction appeared to have positive impact on other students within the setting, and their desire to effectively engage with students with SC&I needs, in line with Argyropoulou and Papoudi's (2012) study. They may provide another communication partner for those with SC&I needs to engage with, therefore likely to have a positive impact on early communication skills, however this raises long-term ethical considerations about the accessibility to an equitable peer group for those with SEND (Child of the North, 2024). Although the current study supported the development of relationships and belonging in the setting, known to underpin early communication skills, it is recognised aspects of the intervention led to elements of social exclusion, raising the question of the extent to which Intensive Interaction within a mainstream setting is truly inclusive.

5.2.1.1 Conclusions

In summary, although quantitative findings which aimed to answer this RQ are mixed, qualitative findings are broadly positive and highlight the influence which Intensive Interaction can have on early communication skill development.

In addition to the direct impact on participating children, the intervention appeared to have a significant impact on key adults facilitating the approach and their understanding of SC&I needs. It can be argued this study indirectly impacted early communication skills of the school community more broadly, by developing key adult's understanding, their desire to share knowledge with their colleagues and develop plans to support other children in attendance.

5.2.2 RQ2: What are teaching staff's experiences of using Intensive Interaction with young people in mainstream schools?

In the current study, the experiences of the teaching staff using Intensive Interaction within mainstream schools varied significantly. Themes will be discussed in turn, considering the links to previous literature.

A common theme considered the effortless nature of Intensive Interaction, and the opportunity to develop relationships between key adults and children with SC&I needs, in line with previous research (Mourière & Scott-Roberts, 2017; Bhogal, 2022). This likely links to the pedagogy of the approach, based on the caregiver-infant relationship (Ephraim, 1982) and may explain the aspects of nurture experienced by participants. For many, the approach felt natural and confirmed a preferred interaction style, which again, may be linked to pedagogical history. This finding is particularly important due to previous evaluations of the approach raising concerns that practitioners may not encompass the philosophy of relationship development when utilising the approach, and reciprocal communication, and that many rely on imitation (Barber, 2008), which may be perceived as mocking those with SC&I needs to external observers (Caldwell, 2006), linked to adult's concerns regarding the anxiety provoking nature of the intervention, discussed later.

The qualitative data illustrated most key adults were motivated to implement the intervention and were optimistic it would have a positive effect on children's development. This suggests adults understood their role in the communication partnership (Anderson, 2004) and the necessity to adapt their communication style (Nind & Hewett, 2005) for it to be successful. Interactions were described as immersive and requiring focused attention, which may be indicative of the need for attunement within Intensive Interaction, listening to the learner's language with all senses (Caldwell, 2013).

Key adults shared the enjoyment and sense of pride felt during sessions, especially when children were utilising their preferred communication style, suggesting the mutual pleasure felt (Nind, 1999) linked to success (Bhogal, 2022). Participants felt supported by the setting in implementing Intensive Interaction, particularly by SLT

and class teachers, however, it is noted this is likely impacted by the recruitment processes as settings opted in, and therefore this finding should be interpreted with caution.

Many of the participating adults appeared to relish the opportunity to learn a new intervention and highlighted the importance of developing their skills to subsequently improve their confidence in their role. This reiterates findings which posit Intensive Interaction as a framework for developing an understanding of SC&I needs and recognition of alternative methods of communication (Bhogal, 2022), perhaps providing needed training in an area which education staff feel underconfident in (Jordan, 2008; Webster & Blatchford, 2014).

This appeared to be an ongoing process, rather than the impact of a singular training session, with staff emphasising the importance of reflection, which likely contributed to their expanding knowledge and confidence as they gained experience. Donnelly et al., (2015) notes reflection is key for successful implementation, with other studies in the topic evidencing the ways in which this can be achieved, i.e., through reflective logs (Argyropoulou & Papoudi, 2012; Kellett, 2000), peer supervision (Mourière & Hewett, 2021) and self-reflection via video recording procedures (Mourière & Scott-Roberts, 2017; Kellett, 2000; Argyropoulou & Papoudi, 2012). Although beyond the scope of the current research, participants spoke about the video recording providing this opportunity, as watching themselves improved or changed their approach, despite being somewhat uncomfortable. Discussed within the limitations and ethical considerations (section 5.3 & 5.4), it is recognised the use of video recordings may have impacted the findings, despite mitigating actions taken. Specifically, regarding key adult's experiences, the video procedure may have contributed to feelings of anxiety.

Many highlighted Intensive Interaction felt isolating and anxiety provoking, due to the need to conduct techniques separately to the class, and anticipating potential judgement from others, such as colleagues who may not understand its purpose. This suggests that although there is perceived to be greater acceptance of neurodiversity generally (Morris, 2024), the impact of societal norms increased

participants apprehension of appearing to be ‘mocking’ (Caldwell, 2006) or infantilising pupils (Caldwell, 2013).

Using Intensive Interaction afforded an opportunity for many key adults to challenge their misconceptions around SC&I difficulties and the perspectives of others. The training provided a new perspective for supporting these students, which may be surprising considering its conception began nearly 50 years ago, however, likely illustrates the limited training available for staff supporting within educational settings (NAS, 2023). Positively, participants reflected on the intervention’s ease compared to those which require significant resources. This will be discussed within section 5.2.3, however, further emphasises the role of the communication partner and the resources they have in terms of their voice, touch and body language that can develop reciprocal patterns of communication (Hewett, 2007; Mourière & Scott-Roberts, 2017), which likely supported staff’s developing confidence.

Not only were participants in disbelief at the ease of Intensive Interaction, but also in the observed outcomes for pupils. Previous research suggested the specificity of a child’s needs may predict intervention efficacy (Tee & Reed, 2017). This view was broadly held by some participants in the current study, as they felt the intervention would not work due to the complexity of children’s needs. A separate theme, ‘this isn’t going to work here’, encompassed the scepticism felt and concerns it would not be effective, particularly within a mainstream setting. This may be linked to its history in SEND environments (Nind & Hewett, 2005) and potentially resistance to the breadth of need routinely found in mainstream classrooms at present (DfE, 2022; NAS, 2023). Furthermore, the open-ended and taskless nature of the interaction was at dissonance with practitioners view of their role and the goal-oriented nature of education, reflecting the debate discussed in section 2.4.5 as to whether Intensive Interaction is simply an inclusive practice or a curriculum that develops communication skills (Firth, 2009).

This view was likely reinforced by participants frustration at inconsistent or gradual outcomes, particularly considering the pressures within education. At times, staff queried the point of the intervention and considered whether the time would be better spent elsewhere, aligning with previous findings (Bhogal, 2022). From a

developmental perspective, this raises the question of key adults' understanding of the importance of communication underpinning subsequent learning (Bruner, 1983; Snow, 1977). These factors likely impacted engagement with the intervention, which may have affected the study's findings.

The observed benefits of using Intensive Interaction provided evidence which challenged participants beliefs and other's perspectives, and moreover, motivated many to seek opportunities to share this training with colleagues, therefore positively impacting the whole school community.

5.2.2.1 Conclusions

To conclude, teaching staff's experiences in using Intensive Interaction with young people in mainstream schools varied, reflecting a positive experience overall which developed key adult's skills and confidence in supporting children with SC&I needs. It is recognised the sampling approach may have impacted these findings, as key adults and educational settings expressed an interest in participating, and therefore likely had an optimistic attitude and motivation to learn more.

Despite this, the findings illustrate the need to have a shared understanding of the approach within educational settings, to support key adult's confidence in implementation and reduce the need to challenge potential judgements from others. Experiences of participants who struggled with the overall 'point' of the approach highlight the importance of teaching staff understanding the trajectory of communication skills which are pivotal to later learning, indicating further training within this area would be beneficial. Effort should be made to ensure that staff understand the influence of genuine relationships underpinning the approach, and the use of Intensive Interaction to develop connections and reciprocal communication methods, as opposed to modifying an individual's behaviours, in line with neuro-affirmative practice.

5.2.3 RQ3: What factors are perceived to support and hinder the implementation of Intensive Interaction in mainstream schools?

Considering the current context of SEND and the prevalence of learners with SC&I needs accessing mainstream education, the final RQ aimed to consider factors which were perceived to impact the overall success of implementing Intensive Interaction within mainstream schools. The themes from the qualitative data will be discussed in turn with consideration to key findings from previous research in the area.

The values and expectations of the school appeared to play a significant role in the success of the intervention. Some participants reflected on the academic focus typically observed within mainstream educational settings and the taskless nature of the intervention challenging that perspective. However, Bhogal (2022) found Intensive Interaction supported adults in being able to effectively assess progress and next steps, suggesting the approach is focused on developmental outcomes, and moreover, supports the development of a more meaningful curriculum for pupils with SC&I needs.

Concerns were raised by a few participants around Intensive Interaction techniques which encourage communication through alternative means, such as physical touch or proximity, typically discouraged within a school environment. However, key adults showed confidence in challenging this and developed their understanding that this cohort of students have differing communication styles, which should be utilised as a strength for interaction development (Jaswal & Akhtar, 2019).

One factor which appeared to impact the implementation of the approach was the perspective that Intensive Interaction may negatively impact other children and their development. This lies in direct opposition to previous research which suggested Intensive Interaction improved peer relationships and children not directly targeted by the intervention exhibited more positive social behaviours (Argyropoulou & Papoudi, 2012; Mourière & Hewett, 2021).

The perceived inclusivity of educational settings was highlighted as a supportive factor, as by valuing individual differences, this increased key adults confidence

whilst legitimising the students communication style. This finding aligns with the neurodiversity movement, valuing diversity across thinking, behaviours, and specifically communication across human nature (Singer, 1999), and supports outcomes as postulated by Firth (2009) within The Dual Process Model (Figure 4). Despite this, the need to legitimise the approach to colleagues remained a prevalent issue.

Considering the specific context which Intensive Interaction took place in, key factors identified included: time, space and opportunity, consistent delivery, the key adult as a primary resource, and finally the need to reflect on the external environment. In line with previous research, the findings from the current study suggest although Intensive Interaction provided an opportunity and 'space' to develop connections (Mourière & Scott-Roberts, 2017), this could be impacted by the typical routines and pressures associated with a school environment (Bhogal, 2022). One factor which may have also contributed to the findings within RQ1 is the inconsistency of the intervention due to school factors or child absence. Although these external factors could not be controlled for, the philosophy of the approach emphasises learning through rehearsal, in line with early childhood development (Mourière & Scott-Roberts, 2017; Mourière & Hewett, 2021). Furthermore, as previous research has observed regressions following intervention withdrawal (Kellett, 2000; Argyropoulou & Papoudi, 2021), this reiterates the importance of consistent intervention delivery.

Many discussed the range of activities utilised across the intervention, which was also noted through fidelity checks conducted by the researcher and analysis of anecdotal data from Phase 1. Despite this, key adults valued that the intervention required little to no equipment, illustrating the flexibility of the sessions as outlined by Hewett, (2007) and the perceived adaptability of the approach. This reiterates the main resource for Intensive Interaction is the communication partner and their voice, body language and facial expressions (Hewett, 2007; Mourière & Scott-Roberts, 2017). Considering the financial difficulties identified within the SEND review (DfE, 2022), an intervention which does not required specialised resources arguably has important implications. It is, however, important to note most children within this study had an EHCP providing them with key adult support, a resource in itself. The fact resources were utilised at times, could signify the extent to which the communication

partners valued the child-led nature of Intensive Interaction, joined the children in their interests (Mourière & Hewett, 2021) and used their preferences as a basis for communication development (Murdoch, 1997). However, Ruth found resources appeared to have a negative impact on Levi's availability at times due to his intense focus, a finding which opposes previous research (Kellett, 2000; Mourière & Hewett, 2021; Argyropoulou & Papoudi, 2012). Whilst this suggests resources could be a hindering factor for some, it exemplifies the importance of personalising the approach.

There appeared to be a distinct need to consider whether the current context would support the interaction. It was noted both communication partners needed to be able to focus on the intervention, meaning it was not always appropriate within the main classroom. This may link to the importance of prioritising attunement (Caldwell 2013; Mourière & Scott-Roberts, 2017; Bhogal, 2022), and the need for ongoing reflection (Donnelly et al., 2015), however does raise the question around how easy it would be to implement in every mainstream setting.

Relatedly, 'buy in' appeared to influence the success of Intensive Interaction within the setting. This included the perspectives and emotions of adults facilitating (explored within section 5.2.2). Considering the significance of the communication partner's role in successful interactions with this population, (Anderson, 2004), this is understandably a factor which would impact implementation and outcomes. This theme also considered the extent to which this intervention and supporting SEND more broadly was prioritised by the setting. It is, however, recognised settings chose to participate and agreed to complete the procedure as set out by the researcher, likely influencing this finding.

It appeared important to several participants that the intervention was legitimised by a professional, namely the researcher in their dual role as a TEP, which permitted key adults to use the approach and challenge the perspectives of others. This supports the considerations described in section 2.3.2.2, relating to the role of the EP in supporting SC&I needs, particularly through developing staff's understanding of behaviours associated with this area of need.

In line with findings from Barber's (2008) study, several key adults appeared to have misunderstood approaches associated with Intensive Interaction, which impacts the reliability of the findings, in addition to impacting the outcomes for participating children. From an implementation perspective, specific factors that supported key adult's understanding were highlighted throughout the interviews. Specifically, the benefit of having concrete resources to refer to, and a preference for discussions with a "more knowledgeable other", in school or through check-ins with the researcher. This would likely provide an opportunity for ongoing reflection (Donnelly et al., 2015) and expand adult's understanding of theoretical underpinnings and specific techniques to fully encompass the philosophy of Intensive Interaction, as postulated by Nind (2000). Had this been available within the school, this may have managed adult's expectations and understanding of the process of the intervention.

Despite this, across the course of the research, most participants developed their understanding and therefore became more intentional with Intensive Interaction techniques. Previous findings suggest positive outcomes may take time (Kellet, 2000; Argyropoulou & Papoudi, 2021), and the current study suggests this may be influenced by the adult's development, rather than the individual needs of the learner. It was noted by the researcher that Liz, was utilising Intensive Interaction approaches prior to the training in her natural interaction style. Perhaps her participation in the study expanded on her skillset and provided further techniques creating an environment for exploration with Joshua, akin to 'tea party rules' as described by Barber (2007). This may have developed for other adults, if the research period was longer, with further opportunities for training or coaching.

By being intentional with techniques, key adults within the current study ensured the interaction was recognisable to the child and their distinct communication style (Nind, 2000), reiterating the individualised nature of the intervention. Furthermore, Intensive Interaction was perceived to be a useful addition to developing a meaningful curriculum for children with SC&I needs, who perhaps cannot access the national curriculum at present, considering the specificity of their needs, inclusivity (Ainscow et al., 2000; Child of the North, 2024) and their next steps of development (Bhogal, 2022). However, the individualised nature means no single description could be provided which impacts the evaluation procedures across the evidence base.

Due to the intervention being bespoke, perhaps it is not surprising a theme generated from the data related to individual differences. However, this theme was more specifically focused on the experiences and perspectives of key adult facilitators. This supports previous findings which emphasise the communication partner's role (Nind & Thomas, 2005; Barber, 2008) but also reflects Intensive Interaction being underpinned by a social model of disability as opposed to considering the difficulties with SC&I to be within child alone (Bikenbach, 1993). Despite this, the perceived complexity of children's needs, negatively impacted the key adults view that Intensive Interaction would have the potential for positive change, and therefore their motivation to take part. To navigate this, it was important to recognise small steps of progress (Bhogal, 2022) and children's unique communication style as a strength which could develop enjoyable social experiences (Jaswal & Akhtar, 2019).

Many comments made by key adults reflected the importance of having a full and empathetic understanding of a child's needs prior to taking part, in line with previous findings (Bhogal, 2022). For one participant, Liz, this was pertinent due to being neurodiverse herself, which she hypothesised provided her with an advantage over her neurotypical colleagues when working with children with SC&I needs, as she felt she was able to empathise with their worldview, perhaps increasing attunement as proposed by Siegal (2020). Although this is somewhat anecdotal and the perspective of a singular participant, it is thought-provoking and may benefit from further research.

Liz felt her neurodiversity provided her with additional skills that supported her ability to attune and recognise current needs, a theme which was prevalent across participants. To increase the likelihood of success, findings suggest it is important to ensure the child is available for interaction and their basic needs have been met. This reflects the initial aims of Augmented Mothering (Ephraim, 1982), and the foundations of Intensive Interaction which highlight the relationship between communication and emotional security, linked to Attachment Theory and meeting an infant's basic needs (Bowlby, 1969). Relatedly, it was noted in the current study an existing bond supported implementation, in line with previous findings (Bhogal, 2022), as key adults understood children's needs and likely their style of

communication. Subsequently, in line with prior literature (Mourière & Hewett, 2021; Bhogal, 2022), students were more likely to trust their key adult, which may have supported their acceptance of any change in interaction style. However, most participant pairs had only known each other for 3 weeks prior to the research, suggesting that had the intervention been introduced once the relationship was more established, the outcomes may have been more substantial.

Key adult's existing skills and knowledge of SEND appeared to impact their ability to recognise when children were open for interaction and to interpret their behaviours as communicative. For some, their limited confidence impacted their self-belief that they were capable to implement Intensive Interaction successfully. Whereas, more confident key adults, or those whose skills were recognised by colleagues, felt proficient enough to deliver the intervention, advocate for children's needs, and challenge those who questioned the approach.

Lastly, a subtheme which was perceived to impact the implementation of Intensive Interaction was the adult's role within the setting and their previous experiences. The latter related to experiences of working with SEND, and personal characteristics which may influence their professional role. For example, the 'taskless' nature of the interaction may not fit with all preferred working styles. Intensive Interaction was described to be quite different to interventions which staff had historically been trained in, and, as Hewett (2007) noted, is more flexible and artistic than traditional teaching, focusing on cocreation with the learner and considering SC&I differences through a neuro-affirming lens. With this cocreation in mind, the subtheme also considered how frequently key adults roles allowed them to interact and develop a relationship with participating children. Interestingly, Chloe, the key adult who collected the most data within this study, was infrequently with the student due to her role as a general classroom TA and his move to an enhanced resource unit. It was hypothesised that to an extent, the separation of roles, may have provided her with protected time, where she was unlikely to be asked to complete another task. However, this context does not appear to reflect the underpinning philosophy of Intensive Interaction, emphasising the importance of developing relationships, rather than focusing on skill development or changing behaviours of individuals

Despite the variety of factors which influenced implementation, pertinently, several participants focused on the overall adaptability of Intensive Interaction. In the current study it was hypothesised it would still be effective in settings with a higher proportion of hindering factors and therefore have a place in supporting the development of early SC&I skills in mainstream schools, however outcomes would be greater with more supporting factors in place. Considering the current prevalence of need within mainstream settings and the pressures and workloads which are typically found within education, this finding is particularly useful.

5.2.3.1 Conclusions

In summary, a range of factors which appeared to support and hinder the implementation of Intensive Interaction in mainstream schools have been illustrated within the current study.

Interestingly, many of the findings concern the individual differences of key adults facilitating the approach. This raises a professional implication for the research which suggests consideration should be given to the individual values, experiences and personal characteristics of key adult support provided within schools to increase outcomes for children with SEND.

Although the individual characteristics of the students were considered, this appeared to be related to the key adult's perceptions of the complexity of children's needs and therefore, the likelihood the intervention would instigate positive change. Arguably, this finding reflects the importance of motivation when implementing any intervention within educational settings, and furthermore, illustrates the importance of professional training to legitimise the approach, develop staff's understanding and buy in.

It is recognised although factors such as school 'buy in' were highlighted as key, the current study took place in schools who were willing to participate knowing the procedural aspects of the intervention. Therefore, these factors may be more influential in other settings. Despite this, the perspective that factors can only increase success, suggests the approach will have positive impact regardless and

further illustrates the importance of reflecting on the current context of the environment to increase the likelihood of success.

5.3 Review of Methods Including Strengths and Limitations

The current study has several strengths and limitations. Factors relating to the overall study will initially be discussed before considering factors specific to each phase, focusing on quantitative and qualitative methodology and subsequent implications on the reliability and validity of the findings. For further details on the actions which were taken to mitigate any threats to reliability or validity, see section 3.8.

5.3.1 Broad considerations

One strength of this research is the use of a pilot study which provided an opportunity to reflect on procedural aspects and trial the use of the measures.

Although the use of mixed methods provided a distinct separation of data collected within each phase, the use of mixed methodology supported the ability to evaluate the efficacy of the intervention and perceived impact within mainstream settings and factors which influenced implementation success through triangulation. By using quantitative and qualitative approaches, the current study provides a broader picture regarding the use of Intensive Interaction in this context, which would not be achieved using one method alone.

The participant recruitment process requires consideration. The social validity of the research is enhanced by recruiting from schools supported by the EPS and focusing on children with needs that would typically benefit from EP support. However, as the study utilises a small sample size, and participants naturally have high heterogeneity due to the nature of their needs, this impacts the generalisability of the findings. Furthermore, as the participants were recruited through an opportunistic sampling process, self-selection bias is a valid concern. As potential participants had some understanding of the procedural requirements before agreeing to participate, it is likely they may have had pre-conceived perceptions about the ease of implementing the intervention within a mainstream setting. Arguably, this means the settings that

took part may perceive themselves to be more equipped to use Intensive Interaction than settings that dropped out, due to factors such as staffing, physical space or the value which they place on interventions that support SEND.

It is recognised that the training provided within this research project was brief in nature. Although the procedure allowed for regular meetings which aimed to provide elements of supervision, the training is unlikely to be as in depth as the formalised training provided by the Intensive Interaction Institute, which includes 4 days of teaching over a 6 month period. Despite this, training in Intensive Interaction principles is currently offered by a range of services who support SEND, including EPS's and SaLT. The training provided within the current research was partly limited by the timeline for the project. The findings illustrate the need for services providing training in Intensive Interaction principles to provide ongoing supervision, support and opportunities for further learning and continuous professional development, discussed further in section 5.5.1.

5.3.2 Phase 1: Quantitative

5.3.2.1 Internal Validity

Design

The use of an AB SCED provides an opportunity to evaluate the intervention at an individual level, a factor which is important in research pertaining to SEND (Ledford et al., 2023), and whilst the design enhances the internal validity, this is at the detriment of external validity and generalisability to other populations.

Baseline phase

Despite actions being taken in relation to issues relating to history and maturation, due to the SCED taking place within the naturalistic school setting, several factors were unable to be adequately controlled for. A settling in period for the new academic year was implemented in the hopes of reducing the impact of settling into classrooms or developing new relationships, however, it is recognised some of the participants, particularly Levi, were still settling into school. In hindsight, it would have been preferable to extend the baseline phase in the hopes of it stabilising, however this raises ethical considerations about withholding an intervention from a child who

would likely benefit from it. Additionally, the impact of school holidays and weekends appeared to impact students' overall wellbeing and availability for the intervention, in addition to factors such as sickness. This threat may have also impacted the stability of the baseline for some participants.

A further factor which may have impacted the stability of the baseline is the interaction style which adults utilised prior to the intervention stage. During training key adults were asked to interact with students in their typical manner and if using an activity to use something equally stimulating during each interaction e.g., not using a book one day and exciting sensory activities the next. From the anecdotal data collected during the SCED, there appeared to be a variety of resources used across participants and interactions, which may have impacted the results. Liz, was identified to be the most consistent in her approach, utilising sensory massage during each interaction with Joshua, and the baseline for this pair of participants was the most stable. Interestingly, baseline fidelity checks highlighted she was already using several approaches associated with Intensive Interaction, which may have also supported the consistency of the baseline as the interaction style was similar.

Repeated measures

Previous research evaluating the use of Intensive Interaction has acknowledged difficulties with identifying an appropriate tool to measure progress (Mourière & Scott-Roberts, 2017). In SCED research, typically an observational tool with a distinct behaviour can be tallied, however due to the child-led nature of the intervention, that was inappropriate as the time period would likely vary day-to-day depending on the child's availability for interaction. The Early Social and Communication Skills Framework was created by the author as a novel and exploratory way of measuring these early skills in communication for this population. It is recognised however, that this is an unpublished tool which raises questions around the reliability of the measure. To mitigate this limitation, the measure was based on published assessments in the field of communication and interaction and moreover, additional validity checks were conducted (see section 3.6.1.3).

A strength of the measure is the accessibility and ease of use, highlighted by several of the participants. Furthermore, participants commented on the ability to celebrate

small steps of achievement, imperative when supporting children with SEND. Despite this, the measure may have been insensitive to the breadth of outcomes identified for each child within the qualitative data collection phase, and therefore this may provide one explanation for the findings of the SCED.

The data was collected away from the researcher to reduce the potential for researcher bias and to increase social and ecological validity. This is supported by the notion that SCED data collection can be largely led by school staff (Maydew & Atkinson, 2022), however impacts the fidelity of data collection. Furthermore, it is recognised this measure is subjective, and open to interpretation by each individual user. Although this was pre-empted by ensuring the same key adult led data collection, therefore using their individual interpretation of the framework alone, this raises questions about the overall reliability of the measure. Through fidelity and inter-rater agreement checks, statistical analysis indicated the agreement between researcher and key adults were low and likely to be by chance.

Lastly, for many of the participants there were a substantial amount of missing data, which is thought to be due to child wellbeing, staff shortages and technical error made by key adults. This factor further influences the extent to which the SCED data can be effectively analysed, and any conclusions be drawn.

Video Procedure

The procedural aspect of video recording was implemented to support the accurate completion of measures. A customisation period was used to negate any participant bias. It is, however, hoped that due to the prevalence of camera use in everyday life including school settings, this threat is relatively low. Although covered during training procedures, the researcher noted during fidelity checks the video recording procedure was compromised for several participants as recordings did not always have the child in view and additionally, were often using a front camera of a tablet, which may have been distracting for the child. Subsequently, the researcher sought to alleviate this threat on any additional data collected by reminding participants of the procedure via email.

Data Analysis

Within section 3.5.6, the debate of analysing SCED data is presented. The data in the current study was analysed utilising a visual analysis technique, following technical guidance provided by Kratochwill et al., (2010). However, it is important the results are understood with the limitations of this data analysis procedure in mind. The visual analysis was challenging due to inconsistencies observed within the data set. Additionally, visual analysis is argued to be less reliable compared to statistical tests due to the subjectivity of the method (Kazdin, 1978). Although the current study utilised an inter-rater reliability procedure to navigate this (Neuman & McCormick, 1995), the level of agreement was only moderate.

5.3.2.2 External validity

Due to the SCED utilised and small sample size, the external validity for the current study is low, as discussed in section 3.8.1.2. The findings illustrated the impact of individual differences between the key adults and the children taking part when using Intensive Interaction, making it difficult to generalise the findings. In line with the nature of Intensive Interaction, and the findings of this study which place an emphasis on the individualised nature of the interactions, this reduces the external validity as an explicit description of the intervention phase cannot be provided.

5.3.2.3 Treatment integrity

The delivery of Intensive Interaction was underpinned by the approaches outlined by (Hewett, 2023) and within that, allowed for individualisation and flexibility depending on the responses of and communication style of the child. Naturally, this may have impacted the experimental design, and it is not possible to determine how these changes may have impacted on the effectiveness illustrated by the outcomes. During the intervention phase, interaction sessions were subject to two fidelity checks, as outlined in section 3.6.4. Although these fidelity checks were put into place to enhance the reliability and validity of the current study, the overall understanding of Intensive Interaction and subsequently the delivery of the intervention was questioned for some key adults. This was further illustrated within interview data, as participants appeared to misunderstand the nuance of some Intensive Interaction approaches e.g., turn taking.

This relates to the findings that highlight the importance of adults being reflective and 'picking the moment' appropriately to interact with the child to have the most successful outcomes. Due to the pragmatic factors around organising fidelity checks with 5 sets of participants, the research could only spend so much time at each fidelity check, meaning that on those occasions, the interaction had to take place at that time. This further illustrates occasions where the interaction may not have been conducted at the best time, and therefore the success of the outcomes.

5.3.3 Phase 2: Qualitative

Throughout interviews the researcher conducted member checks, whereby participants were explicitly asked if their experiences had been understood correctly, in addition to providing an opportunity to add, clarify or revisit topics at the end of the interview. The researcher emphasised their genuine interest in honest experiences and reiterated there was no wrong answer to any of the questions. Despite these strategies aiming to support the credibility of the qualitative findings, it is recognised the participants may have felt obliged to agree or provide a perspective on Intensive Interaction which they felt would have been viewed positively by the researcher.

To increase credibility of the qualitative findings, the research aimed to explore a breadth of experiences by interviewing multiple participants. Due to attrition, 5 key adults were interviewed. This is less than the minimum group size of 6, suggested by Braun and Clark (2013) and is recognised to be a small sample.

The nature of using semi-structured interview questions improved the dependability of this phase of the research and its findings. However, questions naturally differed across participants due to follow-up questions which depended on the responses provided by key adults and their specific experiences of using Intensive Interaction.

By using RTA, the qualitative data analysis is subject to researcher interpretation. Although the researcher strived for objectivity and took steps to mitigate this risk, by remaining reflexive, considering alternative interpretations and ensuring codes and themes were built from the data, the results could be biased towards the researchers own assumptions.

During the analysis write up, the researcher considered the extent to which the authenticity of the qualitative findings had been adhered to. Although all voices and contradicting views were considered throughout data analysis, the researcher noted quotes used were often from similar individuals, which raises the question as to whether the research finding were biased or inadvertently privileged more eloquent voices.

5.4 Ethical Considerations

Prior to commencing the research project, ethical approval was provided from the UoN. Whilst guidelines were followed to ensure the study was conducted ethically, the following topics require further discussion.

Caregivers provided parental consent for their children to participate in the research. As part of the consent process, the researcher offered a meeting to explain the intervention in more depth and answer any questions which caregivers may have had. No caregivers requested a meeting with the researcher and moreover, information gathered from the interviews highlighted a limited number of key adult participants discussed the progress of the intervention with caregivers during the research period. Whilst this may signify caregiver did not have any queries and likely reflects the trust which they have in the key adults supporting their children in school, researchers may need to consider how to increase caregiver involvement and informed consent. Furthermore, the researcher wondered whether caregivers were pleased to have additional support in place for their child considering the current context of SEND support within education.

Key adults may have felt somewhat obligated to participate in the research, particularly considering that during the recruitment process school SENCos were initially contacted and indicated their interest. Although this ethical dilemma was navigated by gathering signed consent and verbally checking key adults were willing to participate throughout the research, this remains a relevant concern. It could have also influenced the findings as key adults may have spoken more positively about Intensive Interaction if they perceived it to be valued by the SLT within their setting, alongside key adults potentially sharing views they felt the researcher would approve

of. Additionally, key adults shared that despite mitigating actions, the video recording procedure was uncomfortable.

During recruitment, 3 children were identified as potential participants by schools who were subsequently excluded by the researcher during fidelity checks and pen portrait processes, due to their advanced SC&I skills, making Intensive Interaction an inappropriate intervention. Discussed more thoroughly in section 3.5.1, training was provided in an alternative intervention to support next steps of development, thus mitigating concerns that children may not receive support as anticipated by key adults across home and educational settings. This signifies that within this research study and likely therefore, within school environments more broadly, students may be being identified for interventions which are not appropriate for their needs.

Lastly, the ethical consideration of child assent requires reflection. Discussed in section 3.9.1, child assent was emphasised throughout this study, due to the complexity of the children's needs impacting their ability to provide verbal consent. Although Intensive Interaction principles, and therefore the training, stipulated that the intervention is child-led and should end on the child's terms, it is unclear how much the key adults encompassed this within their facilitating role. This is linked to concerns that key adults misunderstood aspects of the intervention and may have misread signals that illustrated the child did not want to interact further. Research study design may have inadvertently impacted this, as staff may have been continuing Intensive Interaction with the children because it was a data collection day and an appropriate time in relation to school pressures, but this may not have matched up with the child's wellbeing. This is an important consideration, particularly with this population of learners, and should be considered during future research.

5.5 Implications of Findings

This research has contributed to the literature around the effectiveness of Intensive Interaction, specifically focusing on five pupils who were identified as having SC&I needs attending mainstream primary schools. As the research aimed to explore the impact on early communication development, alongside the experiences of key adult

facilitators and factors which impacted implementation, the findings have implications at various levels, which will now be discussed.

5.5.3 Implications for Children with Social, Communication and Interaction Needs

The findings suggest Intensive Interaction can support learners at the earliest stages of communication development and illustrate a range of outcomes which are associated with the FoC (Hewett, 2023). The use of Intensive Interaction within mainstream settings, provides an opportunity to illustrate small steps of progress within SC&I.

Despite this, the study highlights the difficulties in measuring communication development with this population and highlights the breadth of alternative communication methods which may not be being legitimised within their interactions with others. Moreover, the specific characteristics of adult support are illustrated to impact the extent to which children's communication style is legitimised or built upon to develop more nuanced communication skills.

The results of the current study highlight the individualised nature of SC&I needs and the necessity for key adults to have a nuanced understanding of children's needs and preferences prior to utilising Intensive Interaction to support its success. It also considers the contribution it can make towards developing a bespoke and meaningful curriculum for these learners, alongside other adaptations or interventions aimed at supporting their next steps of development.

For students who have participated in this study, schools have been provided with their individual results as part of the SEND graduated approach.

5.5.2 Implications for Staff in Schools

For schools hoping to utilise Intensive Interaction for pupils with complex SC&I needs, the findings from the current study highlight key considerations about the support staff responsible for supporting these learners. In addition to personal characteristics, the research emphasises the importance of ensuring staff are well

versed in the topic of SC&I needs and can advocate for learners with these difficulties.

From an implementation perspective, the study highlights factors that may influence the likelihood of success, however, importantly, a key finding suggests the intervention would likely have a positive effect in any case and be able to adapt to the challenges of the environment, which may support a school's motivation to utilise the approach.

5.5.1 Professional Implications for EP's

The research study highlights the role of EP's in supporting the understanding of SC&I needs in schools, and the importance of early communication skills.

Considering the issues identified within recruitment, where several potential participants were not appropriate, it would likely be beneficial to consider how EP's can provide further support to ensure schools understand the target population for specific interventions. This is particularly important for learners with SC&I needs due to the heterogeneity of the population, as interventions must be accurately matched to support development (Murza et al., 2015).

EP's are well placed to provide training in schools, and this research highlights the importance of developing the understanding of key adults working with individual students with SC&I needs, in addition to supporting the understanding of the entire school community. For example, as part of training, it would be pertinent to consider ways to develop awareness of the approach, including its purpose and specific techniques, such as via an information sheet or staff meeting. In doing so, this should reduce the perceived threat of judgement from colleagues when using Intensive Interaction, leading to increased motivation and, subsequently better outcomes.

Considering the arguments around inclusivity and the social model of disability provided within section 2.3, and the results from the current research, it is evident that training in Intensive Interaction should encompass neuro-affirming practices, prioritising the strengths and advocacy of those with SC&I needs, emphasising their communication methods as intentional and diverse. EP's should aim to foster a

culture of acceptance throughout training in Intensive Interaction, normalising differences, and celebrating the diversity of human nature, as opposed to aiming to 'normalise' individuals with SC&I differences (Chapman, 2019). In this way, training would need to focus on supporting staff's understanding of the fundamental underpinnings of developing trusting relationships and reciprocal communication patterns between communication partners, utilising the strengths and communication methods of the individual as a guide, and ensure that training in Intensive Interaction is not seeking to 'fix' or change the communicative behaviours of the individual. Furthermore, the study highlights the importance of continuous review as part of the training process, to improve treatment integrity and offer an opportunity for staff to seek support from a 'more knowledgeable other'. EPS's delivering training or coaching in Intensive Interaction should consider how this may be provided.

As an additional consideration for training, the study illustrated video recording procedures offer an opportunity for further learning and reflection. This suggests videos could be utilised as part of review processes when meeting with external professionals such as EP's, allowing the EP to view the intervention and review this alongside the communication partner. This method could be incorporated into a variety of EP training, in addition to interventions which support SC&I needs specifically.

In addition to the considerations above, EP's are well placed to continue conducting research and adding to the evidence-base in this area, discussed next.

5.5.4 Implications for Future Research

Discussed within Chapter 2, as there is limited research in the topic of Intensive Interaction, specifically within educational settings, more research needs to be undertaken in this area to support learners with SC&I needs.

Although the current study highlighted the potential benefits of using Intensive Interaction in mainstream educational settings, as this is a small sample, further exploration of the use of the approach would be beneficial in similar contexts. Further research should additionally provide the opportunity to evaluate the efficacy of the

approach over an extended period and would likely benefit from a follow up phase to assess the longevity of any outcomes in communication or emotional regulation.

The author recognises the framework created and utilised as part of this study has several limitations, including subjectivity. As previous research evaluating Intensive Interaction have identified difficulties in assessing progress due to limited published measures deemed appropriate for the approach or SEND population, (Mourière & Scott-Roberts, 2017), this highlights a unique contribution of the current study. This measure would, however, benefit from more thorough testing to increase its reliability and validity and ensure that it focuses on the unique communication style of learners with SC&I needs. Nevertheless, the framework proposed within the current study may offer a method of identifying steps of progress.

Considering the importance which the findings place upon key adults understanding of communication development and interventions aimed to support SC&I needs, future research could focus on the extent to which key adults understanding and perspectives change following the use of Intensive Interaction.

Lastly, the researcher considers the impact individual differences appeared to have on the outcomes of using Intensive Interaction within mainstream schools. Throughout the current study, the values and personal characteristics of the communication partner appeared to influence the success of the intervention. It would, therefore, be interesting to evaluate the link between personal characteristics and SEND support within mainstream schools. With specific consideration to one key adult within the current study, this could include exploring the unique support neurodivergent staff may provide for learners with SC&I needs.

5.6 Conclusions

5.6.1 Key Findings

The data from the quantitative phase found the use of Intensive Interaction positively impacted two of the five child participants Communicative Methods and Emotional Factors associated with early communication skills. Quantitative data suggested Intensive Interaction increased one of five children's Attention and Engagement

skills. Pre and post measure data illustrated an increase in Social Communication and Emotional Regulation skills across all participating children. Qualitative data highlighted a broader range of outcomes regarding the use of Intensive Interaction and the impact which this had on the participating children's early communication skills and more broadly, the school community by developing the perceptions and knowledge of key adults and their colleagues.

Key adults experiences of using the intervention varied, and despite the motivation to support this population of students, it is recognised the approach raised feelings of anxiety due to potential judgement, as the intervention appears to oppose the social norms of what is perceived to be an appropriate way of interacting with those with SEND. Findings illustrate the importance of key adults having a nuanced understanding of communication needs more broadly, and the need for a focused goal when utilising Intensive Interaction.

A range of factors have been found to increase the likelihood of success in implementing Intensive Interaction within a mainstream educational setting; however, these factors are not insurmountable. Pertinently, the values of the school and the individual differences of the key adults supporting learners with SC&I needs require consideration.

5.6.2 Unique Contribution

This study offers an evaluation of Intensive Interaction in mainstream primary school settings, at a time where the context of SEND means children with complex SC&I needs are being educated more frequently within mainstream schools at the outset of their education (DfE 2022; NAS, 2023). Due to the plans to develop Enhanced Resource Units within mainstream settings (DfE, 2025) this further reiterates the importance of understanding how to support these students effectively.

The study also provides an exploration of the experiences of key adults facilitating Intensive Interaction, utilising a homogenous group, namely support staff working in mainstream primary school settings. This had been highlighted as a gap in the research by a previous SLR in the topic (Berridge & Hutchinson, 2021).

Furthermore, the current study offers an exploratory measure which could be utilised to measure small steps of progress for this cohort of learners, The Early Social and Communication Skills Framework. Whilst the researcher recognises this measure would benefit from further adaptations and testing, it offers a potential starting point to evaluate the efficacy of interventions supporting early interaction skills and may also prove useful to professionals within education.

This research study contributed to the author's development as a research practitioner and provided an opportunity to experience real-world research at the outset of a career in Educational Psychology, developing an understanding of the implications of providing EP support within education.

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Appendices

Appendix 1 *Studies Excluded from SLR at Full Text*

Codes are linked to the inclusion/exclusion criteria as follows:

A. *Publication type*
B. *Study design*
C. *Population*
D. *Phenomenon of interest*
E. *Context*
F. *Date published*
G. *Language*

Study	Paper Reference	Database/Located	Excluded by criteria
1	ALjaser, K, M. (2017)/ Identifying the interactive communication ability of children with profound and multiple learning disabilities: the intensive interaction approach. *Global Journal of Special Education and Services, 16*(5), 106-125.	Grey Literature Search	A
2	Barber, M. (2008). Using Intensive Interaction to add to the palette of interactive possibilities in teacher-pupil communication. *European Journal of Special Needs Education*, *23*(4), 393–402. https://doi.org/10.1080/08856250802387380	Citation Chaining	C
3	Barber, M. (2007). Imitation, interaction and dialogue using Intensive Interaction: tea party rules. *Support for Learning*, *22*(3), 124–130. https://doi.org/10.1111/j.1467-9604.2007.00459.x	Citation Chaining	D/E
4	Berridge, S., & Hutchinson, N. (2022). Mothers' experience of Intensive Interaction. *Journal of Intellectual Disabilities*, *26*(2), 391–406. https://doi.org/10.1177/1744629521995374	Scopus	C
6	Caldwell, P. (2013). Intensive Interaction: Using Body Language to Communicate. *Journal on Developmental Disabilities*, *19*(1), 33	Citation Chaining	A/C
7	Caldwell, P. (2006). Speaking the other's language: imitation as a gateway to relationship. *Infant and Child Development*, *15*(3), 275–282. https://doi.org/10.1002/icd.456	Citation Chaining	C
8	Calveley, J. (2017). Gaining the power of initiation through intensive	Citation Chaining	C

	interaction. *Learning Disability Practice*, *20*(1), 19–23. https://doi.org/10.7748/ldp.2017.e1797		
9	Culham, A. (2004). Getting in Touch with our Feminine Sides? Men's Difficulties and Concerns with Doing Intensive Interaction. *British Journal of Special Education*, *31*(2), 81–88. https://doi.org/10.1111/j.0952-3383.2004.00333.x	Grey Literature Search	C/E
10	Escalona, A., Field, T., Nadel, J., & Lundy, B. (2002). Brief Report: Imitation Effects on Children with Autism. *Journal of Autism and Developmental Disorders*, *32*(2), 141–144. https://doi.org/10.1023/A:1014896707002	ERIC	D
11	Firth, G., Glyde, M., & Denby, G. (2021). A qualitative study of the practice-related decision-making of Intensive Interaction Practitioners. *British Journal of Learning Disabilities*, *49*(2), 117–128. https://doi.org/10.1111/bld.12355	Scopus	C/E
12	Harris C., Wolverson E. (2014). Intensive Interaction: To build fulfilling relationships. *Journal of Dementia Care*, 22(6), 201427–201430.	Grey Literature Search	C
13	Heimann, M., Laberg, K. E., & Nordøen, B. (2006). Imitative interaction increases social interest and elicited imitation in non-verbal children with autism. *Infant and Child Development*, *15*(3), 297–309. https://doi.org/10.1002/icd.463	Scopus	E
14	Jones, K., & Howley, M. (2010). An investigation into an interaction programme for children on the autism spectrum: outcomes for children, perceptions of schools and a model for training: An Investigation into an Interaction Programme for Children on the Autism Spectrum. *Journal of Research in Special Educational Needs*, *10*(2), 115–123. https://doi.org/10.1111/j.1471-3802.2010.01153.x	Citation Chaining	C/D
15	Kellett, M. (2004). Intensive Interaction in the inclusive classroom: using interactive pedagogy to connect with students who are hardest to reach. *Westminster Studies in Education*, *27*(2), 175–188. https://doi.org/10.1080/0140672040270207	Citation Chaining	A/C
16	Markodimitraki, M., & Kalpidou, M. (2021). Developmental changes in imitation during mother-infant interactions. *Early Child Development and Care*, *191*(10), 1602–1612. https://doi.org/10.1080/03004430.2019.1660962	ERIC	C

17	McKim, J., & Samuel, J. (2021). The use of Intensive Interaction within a Positive Behavioural Support framework. *British Journal of Learning Disabilities*, *49*(2), 129–137. https://doi.org/10.1111/bld.12367	ERIC	C/E
18	Nind, M. (1999). Intensive Interaction and autism: a useful approach? *British Journal of Special Education*, *26*(2), 96–102. https://doi.org/10.1111/1467-8527.t01-1-00114	ERIC	C
19	Nind, M., & Kellett, M. (2002). Responding to individuals with severe learning difficulties and stereotyped behaviour: challenges for an inclusive era. *European Journal of Special Needs Education*, *17*(3), 265–282. https://doi.org/10.1080/08856250210162167	Citation Chaining	A
20	Nind, M., & Powell, S. (2000). Intensive interaction and autism: some theoretical concerns. *Children & Society*, *14*(2), 98–109. https://doi.org/10.1111/j.1099-0860.2000.tb00158.x	Scopus	A
21	Sadeghi, S., Pouretemad, H. R., Khosrowabadi, R., Fathabadi, J., & Nikbakht, S. (2021). Parent-child interaction effects on autism symptoms and EEG relative power in young children with excessive screen-time. *Early Child Development and Care*, *191*(6), 827–836. https://doi.org/10.1080/03004430.2019.1649256	Citation Chaining	C/D
22	Salt, J., Sellars, V., Shemilt, J., Boyd, S., Coulson, T., & McCool, S. (2001). The Scottish Centre for Autism Preschool Treatment Programme: I: A Developmental Approach to Early Intervention. *Autism : the International Journal of Research and Practice*, *5*(4), 362–373. https://doi.org/10.1177/1362361301005004003	ERIC	D/E
23	Zeedyk, M., Davies, C., Parry, S., & Caldwell, P. (2009). Fostering social engagement in Romanian children with communicative impairments: the experiences of newly trained practitioners of Intensive Interaction. *British Journal of Learning Disabilities*, *37*(3), 186–196. https://doi.org/10.1111/j.1468-3156.2009.00545.x	ERIC	C/E

Appendix 2 *SLR Data Extraction Synthesis*

Author	Design & Methodology	Participants & Context	Findings	Limitations
Argyropoulou & Papoudi (2012)	ABA Single Case Experimental Design Video analysis child-peer dynamics; frequency of initiations and types of responses including positive and negative responses. Interrater agreement - 95%.	6-year-old male diagnosis of autism attending preschool. A1 – baseline play with peer. B – training phase – using interactive play and techniques drawn from Intensive Interaction prior to play with peer. A2 - play with peer, intervention withdrawn Each phase included 5 sessions lasting approximately 10-15 minutes, across a two-month period Greece	Social initiations improved and decreased when the intervention was withdrawn. Positive responses remained improved. Social behaviour of peer improved despite not receiving the intervention, potentially due to improvements in focus child/development of relationship. Focus child initiation changes: - Phase A1 to B – increase 75%. - Phase B to A2 – decrease 75%. - Phase A1 – A2 – no change. Peer response changes: - Phase A1 – B – Increase 144% - Phase B – A2 – decrease 46% - Phase A1 – A2 – increase 33% Peer initiation changes: - Phase A1 – B – increase 255% - Phase B – A2 – decrease 28% - Phase A1–A2– increase 154% Focus child response changes: - Phase A1-B – increase 460% - Phase B-A2 – decrease 29% - Phase A1-A2 – increase 300% Anecdotal evidence: - During Intensive Interaction – engagement, eye contact, joint focus, initiating communicative behaviours.	Appeared willing to communicate and initiate prior to experimental period Study used techniques drawn from Intensive Interaction. It is not clear which techniques or the training that the practitioners had received Planned ABAB design, not possible due to organisation Due to ethical concerns regarding withdrawing intervention, this period was reduced Some aspects of interactive play evident in B and A2 phases Case study

			- Following study, improved social connections.	
Bhogal (2022)	Qualitative design Phenomenology Semi-structured interviews following Intensive Interaction training and Recording Intensive Interaction Outcomes (RIIO) Training – from the Intensive Interaction Institute which focuses on FoC2. Reflexive Thematic Analysis	11 adult practitioners using Intensive Interaction with children aged 7-18 with autism and severe intellectual disabilities attending a SEND setting. Staff had differing backgrounds in Intensive Interaction. Refresher training provided within research. UK	Themes and subthemes: 1.Pupils at the centre of the practice – pupils had to be understood as individuals, reading behaviours enabled practitioners to understand the pupils, pupils can have more control 2. Pupils at the centre of thinking and practice – practitioners are uniquely able to understand the pupils, a balance of control, pupils in the family context 3. Relationship building – bi-directionality of the transactional model, relationship depth 4. Relationships for wellbeing for pupils with the dual diagnosis – building relationships for wellbeing based on trust, the impact of pupil needs on relationship building 5. Coregulation using the principles of Intensive Interaction – using the principles of Intensive Interaction brings about changes, practitioners reliance on instinct rather than on measurement, co-regulation in the short term 6. Self-regulation – self-regulation can be understood through changes in behaviour, self-regulation develops over time, self-regulation can and should be taught	Doctorate research therefore not peer reviewed Focus on RIIO in addition to Intensive Interaction Staff had varied experiences Small sample size, lack of generalisability As outcomes were not measured, researcher states intervention utilises the principles of Intensive Interaction Researcher was assistant headteacher within the setting
Kellett (2000)	Multiple-baseline interrupted time-series Quantitative	5-year-old male, attending a SEND school	Improvements observed for facial gaze (23%), social physical contact (15.3%), joint focus (52%), eye contact (7%)	Single case study therefore findings are not generalisable

	Case study from larger study Videoed observation – social behaviours coded and agreed using inter and intra-observers. Teacher log of reflections Pre-verbal Communication Schedule (PVCS) Physical Sociability Assessment Scale	Diagnosed with severe cognitive delay, with presenting behaviours which suggested likely autism. Pre-verbal 12-week baseline 38 weeks of Intensive Interaction sessions 10 minutes daily with teacher UK	Improved engagement in social interaction during Intensive Interaction sessions Anecdotal evidence – improved contingent vocalisations and use of vocalisation to initiate with teachers/peers. Physical sociability assessment – improvements of 3 points PVCS – pre intervention score of 0. Post intervention completed pre-verbal communication categories Anecdotal evidence – began to use sign language post intervention	Anecdotal data not necessarily reliable
Mourière & Hewett (2021)	Case study Qualitative Weekly Intensive Interaction consultation sessions over Skype – 2 per month for 6 months Feedback from parents' observations and video evidence	14-year-old male with PDD-NOS, attending SEND school Parents sought advice from the Intensive Interaction Institute to use approach at home Unknown country, assumed to be outside of the UK	Suggested improvements in: - Using eye contact - Facial expressions - Taking turns - Extended engagement with another person/joint attention - Structure of conversation - Language i.e. vocabulary, questioning, expressive language and responses - Wellbeing – calmer, assertiveness, confidence, - Initiating - Sharing interests - Independence/concentration in academic work - Reductions in repetitive behaviours	Case study therefore findings cannot be generalised No analysis of qualitative data Data taken from notes made during consultation

Mourière & Scott-Roberts (2017)	Action research Quantitative Trial of assessment tool FOCAL wheels (Fundamentals of Communication Assessment and Learning). Effect sizes calculated by Cohen's d Video used and coded observation using FOCAL wheels. Independent reviewer assessed video footage in addition to researcher 4 times over the intervention. Parents assessed baseline and follow up	10-year-old male with autism, attends a SEND setting 2-week baseline 12-week intervention at home, implemented by researcher UK	Large effect sizes indicated for: -vocal/auditory in reactive, proactive and interactive domains -tactile/haptic in the interactive domain -visual/gestural in the reactive, proactive and interaction domains No significant changes noted in the tactile/haptic modality for reactive and proactive domains Anecdotal data highlighted improvements in eye contact, pointing and gesturing, and improvements in communication noted outside of the sessions, i.e., at school. Follow up data highlighted further progression.	Action research – researcher took part, which could raise issues of bias, despite use of independent reviewer Anecdotal data may not be reliable. Some improvements only noted by one observer FOCAL wheels created as part of research, not standardised and several limitations highlighted
Sri-Amnauy (2012)	Qualitative study Phenomenology Semi-structured interviews, focus groups and participant observation Thematic Analysis Participant observation with observation schedule	11 teachers recruited from a 2-day training course in Intensive Interaction working in specialist and mainstream settings, teaching students (n = 18) who were pre-verbal diagnosed with autism and SLD Half day workshops followed to support implementation Thailand	Themes: 1. Becoming a responsive teacher: the challenge of the transition process 2. Factors encouraging the use of Intensive Interaction in the Thai school context 3. Perceived barriers to Intensive Interaction in the Thai school context 4. Supporting the sustainability of Intensive Interaction in the Thai school context	PhD thesis therefore not peer reviewed Not all participants were able to attend focus groups Small group cannot be generalised

Tee & Reed (2017)	Case-control study design Quantitative Strengths and Difficulties Questionnaire (SDQ) – pre and post measure to measure changes in behaviours Social Communication Questionnaire (SCQ) & Hospital Anxiety and Depression Scale (HADS) to investigate predictors for outcome of Intensive Interaction	40 males at SEND school - diagnosed with autism or PDD-NOS. Intervention group n=20 Intensive Interaction at home, delivered by researcher Control group n=20 Mean age = 9.90 Groups matched on age, intellectual functioning and language functioning 6 months UK	No significant difference on SDQ scores following intervention. F(1,37 =1.84. *P* > 0.10, n2p = 0.047. No significant predictors based on age, time since diagnosis, intellectual functioning, language functioning or scores from SCQ Problem behaviour scores and parental depression at baseline negatively correlated to change in problem behaviours, suggesting that fewer behavioural problems and lower levels of depression in parents may have better outcomes for intervention: r = -0.616, $p < 0.01$ β= -0.0336, t = 2.82, $p < 0.01$	Not RCT and relatively small sample size Control sample attended a SEND setting where staff were well trained in supporting C&I needs

Appendix 3 *MMAT (Hong et al., 2018) Quality Appraisal Tool – WoE A*

The Mixed Methods Appraisal tool is a critical appraisal tool for efficient use in systematic mixed studies to appraise the methodological quality of five categories including: qualitative research, randomised controlled trials, non-randomised studies, quantitative descriptive studies and mixed methods studies (Hong et al., 2018). Checklists vary depending on the type of study. Checklists for the studies included in this review can be found below.

Scoring
The MMAT has been scored by dividing the number of criteria met by 5 to give a percentage between 0-100%.
A MMAT score of 0-33% = low, 34-66% = medium, 67-100% = high. These scores can be found in the title of each table.

Argyropoulou & Papoudi (2012); The training of a child with autism in a Greek preschool inclusive class through intensive interaction: a case study – 80% High					
		Yes	**No**	**Can't tell**	**Comments**
Screening Questions	S1. Are there clear research questions?	X			
	S2. Do the collected data allow to address the research questions?	X			
	Further appraisal may not be feasible or appropriate when the answer is 'No' or "Can't tell' to one or both screening questions				
3.Quantitative non- randomised	3.1 Are the participants representative of the target population?	X			
	3.2 Are measurements appropriate regarding both the outcome and intervention (or exposure)?	X			
	3.3 Are there complete outcome data?	X			
	3.4 Are the confounders accounted for in the design and analysis?	X			
	3.5 During the study period, is the intervention administered (or exposure occurred) as intended?		X		Change from ABAB to ABA – ethical

					implications, not effect on intervention Some possibility of Intensive Interaction approaches being utilised during A2 and B phase.

Bhogal (2022); School practitioners perceptions of the impact of Intensive Interaction on the emotional wellbeing of pupils with severe intellectual disabilities and autism - 100% High					
		Yes	**No**	**Can't tell**	**Comments**
Screening Questions	S1. Are there clear research questions?	X			
	S2. Do the collected data allow to address the research questions?	X			
	Further appraisal may not be feasible or appropriate when the answer is 'No' or "Can't tell' to one or both screening questions				
1.Qualitative	1.1 Is the qualitative approach appropriate to answer the research question?	X			
	1.2 Are the qualitative data collection methods adequate to address the research question?	X			
	1.3 Are the findings adequately derived from the data?	X			
	1.4 Is the interpretation of results sufficiently substantiated by data?	X			
	1.5 Is there coherence between qualitative data sources, collection, analysis and interpretation?	X			

Kellett (2000); Sam's story: evaluating Intensive Interaction in terms of its effect on the social and communicative ability of a young child with severe learning difficulties – 100% High					
		Yes	**No**	**Can't tell**	**Comments**
Screening Questions	S1. Are there clear research questions?	X			
	S2. Do the collected data allow to address the research questions?	X			
	Further appraisal may not be feasible or appropriate when the answer is 'No' or "Can't tell' to one or both screening questions				
3.Quantitative non- randomised	3.1 Are the participants representative of the target population?	X			
	3.2 Are measurements appropriate regarding both the outcome and intervention (or exposure)?	X			
	3.3 Are there complete outcome data?	X			Intervals not always regular due to illness, school events and holidays
	3.4 Are the confounders accounted for in the design and analysis?	X			Maturity discussed – none shown during baseline and regression in school holidays.
	3.5 During the study period, is the intervention administered (or exposure occurred) as intended?	X			

Mourière & Scott-Roberts (2017); Measuring the impact of Intensive Interaction on joint attention and intentional communication using the FOCAL wheels - 100% High

		Yes	No	Can't tell	Comments
Screening Questions	S1. Are there clear research questions?	X			
	S2. Do the collected data allow to address the research questions?	X			
	Further appraisal may not be feasible or appropriate when the answer is 'No' or "Can't tell' to one or both screening questions				
3.Quantitative non- randomised	3.1 Are the participants representative of the target population?	X			
	3.2 Are measurements appropriate regarding both the outcome and intervention (or exposure)?	X			
	3.3 Are there complete outcome data?	X			
	3.4 Are the confounders accounted for in the design and analysis?	X			Independent reviewer Pre and Post additional observers
	3.5 During the study period, is the intervention administered (or exposure occurred) as intended?	X			

Mourière & Hewett (2021); Autism, Intensive Interaction and the development of non-verbal communication in a teenager diagnosed with PDD-NOS: a case study – 80% High					
		Yes	**No**	**Can't tell**	**Comments**
Screening Questions	S1. Are there clear research questions?	X			
	S2. Do the collected data allow to address the research questions?	X			
	Further appraisal may not be feasible or appropriate when the answer is 'No' or "Can't tell' to one or both screening questions				

1.Qualitative	1.2 Is the qualitative approach appropriate to answer the research question?	X			
	1.2 Are the qualitative data collection methods adequate to address the research question?	X			
	1.3 Are the findings adequately derived from the data?	X			
	1.4 Is the interpretation of results sufficiently substantiated by data?	X			
	1.5 Is there coherence between qualitative data sources, collection, analysis and interpretation?		X		

Sri-Amnauy (2012); Perceptions of teaching pre-verbal pupils with autism and severe learning difficulties: factors influencing the application of Intensive Interaction in the Thai culture – 80% High					
		Yes	**No**	**Can't tell**	**Comments**
Screening Questions	S1. Are there clear research questions?	X			
	S2. Do the collected data allow to address the research questions?	X			
	Further appraisal may not be feasible or appropriate when the answer is 'No' or "Can't tell' to one or both screening questions				
1.Qualitative	1.3 Is the qualitative approach appropriate to answer the research question?	X			
	1.2 Are the qualitative data collection methods adequate to address the research question?	X			
	1.3 Are the findings adequately derived from the data?	X			
	1.4 Is the interpretation of results sufficiently substantiated by data?	X			
	1.5 Is there coherence between qualitative data sources, collection, analysis and interpretation?			X	

Tee & Reed (2017); Controlled study of the impact on child behaviour problems of intensive interaction for children with ASD – 100% High

		Yes	No	Can't tell	Comments
Screening Questions	S1. Are there clear research questions?	X			
	S2. Do the collected data allow to address the research questions?	X			
	Further appraisal may not be feasible or appropriate when the answer is 'No' or "Can't tell' to one or both screening questions				
3.Quantitative non- randomised	3.1 Are the participants representative of the target population?	X			
	3.2 Are measurements appropriate regarding both the outcome and intervention (or exposure)?	X			
	3.3 Are there complete outcome data?	X			
	3.4 Are the confounders accounted for in the design and analysis?	X			
	3.5 During the study period, is the intervention administered (or exposure occurred) as intended?	X			

Appendix 4 *Pilot Feedback*

Feedback from the pilot influenced the research in the following ways:

- Key adults felt unclear as to what the outcomes of the intervention *could* be. On reflection, the researcher had been cautious to not influence the outcomes of the study and to ensure that the 'taskless' nature of the intervention had been fully embraced within the training. The training script was therefore tweaked to provide clarity moving forwards.
- Key adults reflected that meeting a few weeks into utilising the approach would have likely been useful to support implementation. Due to the short period of the pilot, this was not planned, however was already planned for the research study as part of fidelity checks.
- The quantitative measures were not changed following the pilot. It was reported that they were simple, clear and easy to follow. The concrete examples supported key adults in scoring the interaction, particularly when deciding between two numbers on the Likert scale. Positive feedback was given about the outcomes being broken down into stages that supported small steps of achievement, in line with the child's delayed development. However, the key adult stated that after using the measure for a few sessions, she felt confident in her knowledge and did not need to rely on it for further data collection, which raised questions around validity. Therefore, during the training in the main study it was reiterated that the measure must be used consistently.
- There was mixed feedback in relation to the use of video recording in the pilot. The key adult preferred notes and did not enjoy watching themselves on film. Additionally, the child was often distracted by the equipment used, as they could view themselves on the screen. However, despite these negatives, by rewatching the video, key adults noticed behaviours exhibited by the child which were not noted during the interaction, and it supported the key adult to reflect upon their skills in Intensive Interaction techniques. As the video recording appeared to improve data collection and provided an opportunity for skill development of key adults, the use of video remained in the study. Efforts were made to ensure that participants felt comfortable using this procedure, and the importance of ensuring that the equipment did not distract the child was reiterated.

Appendix 5 *Inclusion & Exclusion Criteria*

Inclusion	**Exclusion**
Child participants must be in Reception or Key Stage 1, attending a mainstream primary school.	Child participants are in a different key stage, or in attendance at a different educational setting (e.g., independent school or specialist setting).
The child's primary area of need is communication and interaction, which may include but is not limited to a diagnosis of ASD. They must be at the early stages of communication, primarily pre-verbal and show limited interest in others.	Child does not have communication and interaction needs or child already has early communication skills e.g., is showing interest in interacting with others, seeks out interactions frequently, can hold joint attention. Child has significant physical and sensory needs in addition to communication and interaction needs.
Child has not previously or do not currently have Intensive Interaction sessions or techniques used as part of their daily curriculum.	Child has previously experienced Intensive Interaction or is already taking part in sessions in school prior to the start of the research project.
Child participants do not start any other new interventions during the research.	Child participants begin other interventions during the research phase.
Child participants are likely to remain in the school for the duration of the research study and are typically good attenders.	Child participants are known to be leaving or changing schools during the research project.
Adult participants must be employed by the mainstream setting as a teaching assistant or in a similar role supporting children in the setting. The key adult must support the child participant throughout the week to allow them to complete the intervention daily.	Adults are employed in a class teacher role or a role which does not directly work with children. The adult is one of many adults who supports the child across the school day/week and does not work with them for an extended period each day.
Adult participants have had no previous coaching/training in Intensive Interaction prior to taking part in the study.	Adults have previously experienced coaching/training in Intensive Interaction.
Adult participants must have a good level of English to be able to access the training.	Participants are not able to understand the training due to language.
Must have access to video equipment within the school setting e.g., tablet or phone, which is password protected and follows the school GDPR policy.	Is not able to access and use video equipment, or equipment is not password protected as per school GDPR policy.
Consent must be given by all participants or their caregivers to take part in the study.	No consent gained from either or both participants.

Appendix 6 *Example Email Sent to SENCos Identified from EP Casework*

Dear (NAME),

My name is Aimee Turlukowsky, and I am a Trainee Educational Psychologist at (*redacted EPS).* As part of my doctoral training with the University of Nottingham I am intending to carry out a piece of research evaluating the use of Intensive Interaction in mainstream schools. This intervention aims to support children and young people at the early stages of communication.

I am writing to you to enquire whether taking part in this research would be of interest to you as a child in attendance at your school was identified as a likely suitable participant for the research through discussions with your link Educational Psychologist (EP). Taking part will provide the child's key adult training and support in Intensive Interaction techniques and develop the evidence base in this topic, supporting the child in attendance at your school and hopefully other children with communication and interaction needs.

In taking part in the research, a key adult working with the child will be asked to initially measure the child's early communication skills including; methods of communication, attention and engagement and emotional factors, twice a week before being trained in Intensive Interaction techniques by the researcher. The key adult will then be asked to utilise Intensive Interaction at least once per day with the child and measure the same outcomes twice weekly for a period of 8 weeks. To support the key adult in focusing on the interaction style whilst needing to measure outcomes, the key adult will be asked to video their interactions with the child, so that they may complete the measures once the interaction has finished. These videos will need to be taken a password-protected school device such as a tablet or similar and ensure that the child is fully in view. Once the video has been watched back and the measures completed, the key adult will be asked to delete the video. The video will not be collected or viewed by anyone other than the key adult.

Following the end of the intervention period, the key adults will be asked to take part in a short interview about their experiences in using Intensive Interaction to support children in a mainstream primary school. This interview will last for approximately an hour and take place at a time and location which suits them.

Please see the attached participant information sheets for a detailed description of my research and its aim. There is an information sheet for parents of child participants and one for the key adult supporting them in school. I would be grateful if you could pass on the attached and ask them to get in touch with me to confirm if they would like to take part.

Kind regards,

Aimee Turlukowsky

Appendix 7 *Recruitment Poster*

RESEARCH OPPORTUNITY: EVALUATING INTENSIVE INTERACTION IN MAINSTREAM PRIMARY SCHOOLS

The University of Nottingham

UNITED KINGDOM • CHINA • MALAYSIA

WHO AM I?

My name is Aimee Turlukowsky and I am a Trainee Educational Psychologist studying at the University of Nottingham. I am completing research which aims to investigate the use of Intensive Interaction, an evidence-based intervention which supports individuals at the early stages of communication in mainstream primary schools.

WHO CAN PARTICIPATE?

The research requires pairs of participants, a child with communication and interaction needs and a key adult who is supporting them in school. Informed consent will be gathered from participants or their caregivers.

Child participant must:

- Be in Reception or Key Stage 1 in a mainstream setting
- Have communication and interaction needs, primarily non-verbal and showing a limited interest in interactions with others

Adult participant must:

- Be the only key adult supporting child participant in school
- Have not previously had any training in Intensive Interaction approaches
- Have a good level of English to be able to access training

TIMELINE

OCTOBER 2024

- Training in measures
- 2 weeks of collecting baseline measures
- Training in intervention

NOVEMBER-DECEMBER 2024

- 8 weeks of Intervention Use
- Data collection

JANUARY 2025

- One hour interview discussing their experiences of using the Intervention

WHAT WOULD IT INVOLVE?

Phase 1

Key adults will use the intervention daily in school with the child, collecting measures twice a week. Key adults will be required to video their interaction using a password protected school owned device to support them in accurately completing measures. The videos will not be collected by the researcher.

Phase 2

Key adults will be interviewed by the researcher to discuss their experiences in using the intervention. The interview will be audio recorded. All data in this study will be anonymised.

BENEFITS

1. Training and support

Taking part in this research will provide the key adult training in utilising Intensive Interaction to support children with communication and interaction needs.

2. Opportunity to take part in reseach

Participating will contribute further research in this topic area and aims to develop best practice in this area.

Thank you for your interest, I would be very grateful if you are willing to take part.

If you would like to participate or ask for more information about the study, please do not hesitate to contact me at aimee.turlukowsky@nottingham.ac.uk

Ethical approval number - SR1611R

University tutor contact details - sarah.godwin@nottingham.ac.uk

Appendix 8 *Secondary Recruitment Email sent to all Primary Schools*

Good afternoon,

Do you have children with significant social communication and interaction needs currently in Reception, Year 1, or joining your setting next academic year and wondering how you are going to meet these needs?

As part of her doctoral research, one of our Trainee's at *(redacted EPS)* is investigating the use of Intensive Interaction in mainstream schools. This would provide a member of staff in your school with coaching in an evidence-based intervention that will support children who are primarily non-verbal in your setting and in addition, provide an opportunity to be part of research investigating the subject.

If you are interested in taking part, please take the time to look at the recruitment poster and inclusion criteria attached and email Aimee at aimee.turlukowsky@nottingham.ac.uk as soon as possible. Places will be determined on a first come first serve basis and spaces are limited.

Appendix 9 *Information Sheet for Caregivers of Child Participants*

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

School of Psychology
Information Sheet

Title of Project: Investigating the use of Intensive Interaction to support children with communication and interaction needs in mainstream primary schools.

Ethics Approval Number or Taught Project Archive Number: S1611R

Researcher: Aimee Turlukowsky

Supervisors: Sarah Godwin

Contact Details: aimee.turlukowsky@nottingham.ac.uk

sarah.godwin@nottingham.ac.uk

This is an invitation for your child to take part in a research study on evaluating the use of Intensive Interaction, an intervention which aims to support individuals at the early stages of communication, within a mainstream educational setting.
Before you decide if you wish your child to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. This research study is proposed to take place between October 2024 and January 2025.

If you agree for your child to participate, initially a key adult supporting them in school will complete baseline communication and interaction measures for 2/3 weeks. The measures have been developed as part of this research study and aim to measure early communication skills including; methods of communication, attention and engagement and emotional factors such as wellbeing, emotional expression and regulation.

The key adult will then receive training in Intensive Interaction approaches by the researcher before utilising this with your child daily in school. Intensive Interaction is an interaction approach which focuses on developing enjoyable and relaxed interaction sequences between a child and their communication partner (e.g., the adult working with them). It is based on mother-child like interactions and uses the

interests and behaviours of the child as a guide, considering their behaviours as intentional forms of communication to build up meaningful conversations. Techniques include, but are not limited to, joint focus activities, turn taking, sharing personal space, behavioural mirroring and exchanging facial expressions. Daily sessions may last for up to 10 minutes for the purpose of the research, however these sessions are child-led and end when the child signifies that they are finished with the interaction.

During the interaction sessions, the key adult will complete observations twice a week, for a period of 8 weeks, before sending them to the researcher to identify any changes in their communication and interaction development. The key adult in school will be videoing their interactions with your child so that they may easily and accurately complete the early communication skill measures after the interaction sessions to measure any outcomes of using the intervention. Videos will be recorded using a password-protected school-owned device. These videos will not be collected by the researcher or seen by anyone other than the school staff, who will delete them as soon as they have completed the measures. The researcher will come into school to observe several sessions over the course of the study to support the key adults use of the intervention and completion of measures.

The intervention is child-centred, meaning that the principles of Intensive Interaction will ensure that your child wants to take part in interactions with adults. When or if your child signals that they would like any of the interaction to end, adults will respond accordingly.

Following the intervention, the key adult who has been supporting your child in school will take part in a short semi-structured interview to discuss their experiences of using the interaction approach with your child, outcomes which they have noticed not implicitly collected by the measures, factors which may have supported or challenged the implementation of the intervention and the process of taking part in the research. The transcription of the interview will not contain any identifying features about your child or their school. Participants will be given pseudonyms.

Participation in this study is voluntary and you are under no obligation to consent for your child to take part. You are free to withdraw at any point before or during the study. All data collected will be kept confidential and used for research purposes only. It will be stored in compliance with the Data Protection Act.

If you have any questions or concerns, please don't hesitate to ask. I can also be contacted after your participation at the above email address.

If you have any complaints about the study, please contact:
Stephen Jackson (Chair of Ethics Committee)
stephen.jackson@nottingham.ac.uk

Appendix 10 *Consent Form for Caregivers of Child Participants*

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

School of Psychology

Consent Form

Title of Project: Investigating the use of Intensive Interaction to support children with communication and interaction needs in mainstream primary schools.

Ethics Approval Number or Taught Project Archive Number: S1611R

Researcher(s): Aimee Turlukowsky

Email: Aimee.Turlukowsky@nottingham.ac.uk

Supervisor(s): Sarah Godwin

Email: Sarah.Godwin@nottingham.ac.uk

Name of pupil _____ School _____

Date of birth _____ Year group _____

Please circle as appropriate

- Have you read and understood the Information Sheet? YES/NO
- Have you received enough information about the study? YES/NO
- Have you had the opportunity to ask questions and discuss the study? YES/NO
- Have all your questions been answered satisfactorily? NOT APPLICABLE/YES/NO
- Do you understand that you are free to withdraw your child from the study? (at any time and without giving a reason) YES/NO
- Do you agree for your child's key adult to complete the following as part of this study:
    - Daily Intensive Interaction sessions YES/NO
    - Complete twice weekly outcome measures on your child's communication and interaction development YES/NO
    - Video record the intervention session twice a week to support the completion of measures on a school-owned password protected device. The school will delete these video recordings as soon as measures are completed, and these will not be viewed by anyone outside of your child's school YES/NO
- Do you agree for the researcher to observe Intensive Interaction sessions between your child and their key adult in school? YES/NO
- I give permission for the details of the intervention undertaken with my child to be discussed and recorded during a semi-structured interview between their key adult and the researcher YES/NO

- Do you agree to your child taking part in this study? YES/NO

"This study has been explained to me to my satisfaction, and I agree that my child will take part. I understand that I am free to withdraw at any time."

Signature of the Participant: Date:

Name (in block capitals)

I have explained the study to the above parent, and they have provided their informed consent for their child to take part.

Signature of researcher: Date:

Appendix 11 *Information Sheet for Key Adult Participants*

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

School of Psychology
Information Sheet

Title of Project: Investigating the use of Intensive Interaction to support children with communication and interaction needs in mainstream primary schools.

Ethics Approval Number or Taught Project Archive Number: S1611R

Researcher: Aimee Turlukowsky

Supervisors: Sarah Godwin

Contact Details: aimee.turlukowsky@nottingham.ac.uk

sarah.godwin@nottingham.ac.uk

This is an invitation to take part in a research study on evaluating the use of Intensive Interaction, an intervention which aims to support individuals at the early stages of communication, within a mainstream educational setting.

Before you decide if you wish to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

The study will take place from October 2024 to January 2025. If you participate, you will be asked to take part in two phases of the research study, as described below. The first stage will involve initially completing baseline communication and interaction measures with an identified child who you are supporting in school during the first two weeks of October. Training in using these measures will be provided, taking approximately 30 minutes to an hour at the outset of the research study. The measures have been developed as part of this research study and aim to measure early communication skills including; methods of communication, attention and engagement and emotional factors such as wellbeing, emotional expression and regulation.

Following 2/3 weeks of baseline measures, you will be trained in the Intensive Interaction approach by the researcher, taking approximately an hour to 90 minutes, following October half term. Intensive Interaction is an interaction approach which

focuses on developing enjoyable and relaxed interaction sequences between a child and their communication partner. It is based on mother-child like interactions and uses the interests and behaviours of the child as a guide, considering their behaviours as intentional forms of communication to build up meaningful conversations. Techniques include, but are not limited to, joint focus activities, turn taking, sharing personal space, behavioural mirroring and exchanging facial expressions.

You will then be asked to engage in this interaction approach at least once a day with the child (for a maximum of 10 minutes per day) and complete measures twice a week, for a period of 8 weeks across November to December, sending them to the researcher at the end of each week (taking a maximum of 30 minutes to complete measures across the week). You will be asked to video interactions with the child on a password protected school-owned device, to support the accurate completion of measures. The video recordings will not be collected by the researcher, and you will be asked to delete them from the device when measures are completed. The researcher will come into school to observe several sessions over the course of the study to support your use of the intervention and completion of that day's measures, visiting school for approximately 30 minutes each time. The researcher plans to visit once during the baseline phase and twice during the intervention phase.

During the second phase, you will be asked to take part in a semi-structured interview with the researcher in January 2025. This will take place for approximately an hour at a location and time convenient to you. The interview aims to provide an opportunity to discuss your experiences of using the interaction approach, any outcomes which have not been implicitly collected by the measures, factors which may have supported or challenged the implementation of the intervention and the process of taking part in the research itself. The interview will be recorded using audio recording devices and will then be transcribed, ensuring that during the transcription process that any identifying features, i.e., names of adults, children or schools will be anonymised. Following the interview, a transcription of your interview can be requested so that you can review the discussion, should you wish to.

Participation in this study is voluntary, and you are under no obligation to take part. You are free to withdraw at any point before or during the study. All data collected will be kept confidential and used for research purposes only. It will be stored in compliance with the Data Protection Act.

If you have any questions or concerns, please don't hesitate to ask. I can also be contacted after your participation at the above address.

If you have any complaints about the study, please contact:
Stephen Jackson (Chair of Ethics Committee)
stephen.jackson@nottingham.ac.uk

Appendix 12 *Consent Form for Key Adult Participants*

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

School of Psychology

Consent Form

Title of Project: Investigating the use of Intensive Interaction to support children with communication and interaction needs in mainstream primary schools.

Ethics Approval Number or Taught Project Archive Number: S1611R

Researcher(s): Aimee Turlukowsky

Email: Aimee.Turlukowsky@nottingham.ac.uk

Supervisor(s): Sarah Godwin

Email: Sarah.Godwin@nottingham.ac.uk

The participant should answer these questions independently:

- Have you read and understood the Information Sheet? YES/NO
- Have you had the opportunity to ask questions about the study? YES/NO
- Have all your questions been answered satisfactorily? YES/NO
- Do you understand that you are free to withdraw from the study? YES/NO (at any time and without giving a reason)
- I give permission for the interview to be recorded using audio recording equipment and this recording to be stored in a password protected file until the audio has been transcribed. YES/NO
- Do you agree that in taking part in this study, the following will be completed?
    - Daily Intensive Interaction sessions YES/NO
    - Complete twice weekly outcome measures on the child's communication and interaction development YES/NO
    - Video record the intervention session twice a week to support the completion of measures using a password protected school-owned device YES/NO
    - Delete the video recordings as soon as the measures are completed YES/NO
- I give permission for my data from this study to be shared with other researchers provided that my anonymity is completely protected YES/NO
- Do you agree to take part in the study? YES/NO

"This study has been explained to me to my satisfaction, and I agree to take part. I understand that I am free to withdraw at any time."

Signature of the Participant: Date:

Name (in block capitals)

I have explained the study to the above participant and he/she has agreed to take part.
Signature of researcher: Date:

Appendix 13 *Pen Portraits of Participants*

- All names utilised in the pen portraits are pseudonyms, which have been added for readability.
- The pen portraits provide a description of each participant at the outset of the research study, along with brief information about the context of the educational setting in which the research was undertaken.

School 1
School context: Primary school set in a rural village location. Part of an academy trust. Approximately 300 pupils on roll. The school set up an enhanced resource unit during the course of the research.

Child participant: Charlie
Charlie was aged 4 year and 2 months at the outset of the research project. He was attending a reception class full time. His interests included playing with the doll house, in the home corner and exploring water play. Charlie did not have any diagnoses; however, the school were in the process of gathering evidence towards an Education, Health and Care Needs Assessment.

Key adults shared that although Charlie had settled in relatively well to school, he required significant levels of adult support throughout the day. He was still in nappies and needed support in all aspects of self-care. Charlie did not signify if he had soiled his nappy but typically followed an adult if they instigated a nappy change by showing him his nappy.

He struggled with emotionally dysregulation and frequently hit and bit others and screamed often. These behaviours were most often seen if key adults placed a demand on Charlie or said “no”. Charlie preferred to follow his own interests and was frequently observed to be “pottering” around the setting. He occasionally played alongside others if he was able to tolerate their presence, but it was reported that that depended on his mood and emotional regulation at the time.

At the outset of the research, Charlie did not interact with others and if adults attempted to interact with him, he would typically walk away from the area. If adults attempted to engage him with whole class activities such as carpet time, Charlie would likely scream, physically lash out at others and throw himself on the floor.

Charlie showed little interest in communicating and interacting with others. It is reported that he would often babble, grunt or make noises, seemingly to himself. Adults have only heard him use the word “no” occasionally. At times Charlie would accept or seek out key adults for comfort, i.e., a cuddle.

Charlie was in receipt of Attention Autism as an intervention prior to and during the research project. Although each of the schools were asked not to start any additional interventions during the project, it is important to note that Charlie’s school opened an enhanced resource unit during the project which Charlie moved into. This is discussed in the results section, and although not in line with the research procedure, moral and ethical perspectives were prioritised.

Adult participant: Chloe
Chloe had worked at the setting for 11 years at the outset of the research as a teaching assistant across the primary age. She had never worked as a 1-2-1 member of staff for children with additional needs, however had supported children with a range of SEND, including social, communication and interaction needs within the classroom. She had known and worked with Charlie since he started school, which was 3 weeks prior to the start of the research.

School 2
School context: Primary school within a town, with a nursery provision on site. Approximately 200 pupils on roll.

Child participant: Stephen
Stephen was aged 5 years and 3 months at the outset of the research. He was in year 1 and had attended the same school since joining the setting in reception. He attended school full time, however left the setting slightly earlier than his peers as it was reported that he found the busyness of school pick up somewhat overwhelming. Stephen had a fascination with maths and numbers and enjoys sensory play and using the iPad. He had a diagnosis of Autism and an EHCP with 32.5 hours of funding, providing him with a full-time key adult in school. He had previously been assessed/supported by a range of professionals, including the Specialist Teaching Team, Educational Psychologists and Speech and Language.

Stephen had limited language use, using singular words occasionally like “rainbow”. He had recently started using the word “bye”. He often used echolalia, copying sounds or words from adults. Adults used widgets with Stephen to support their verbal communication. Stephen did not often use this method of communication in return.

It is reported that Stephen showed inconsistent interest in others. At times he would watch other children playing or may play alongside his peers. It is noted that Stephen appeared to hyperfocus on activities of his choosing and was hard to shift his attention at these times.

In terms of emotional regulation, Stephen would occasionally come in with a dummy which he used for security. He struggled with changes in routine or being told “no” at which point he would withdraw and curl up in a ball or throw himself on the floor and spit at adults.

During my discussion about Stephen with his key adult Anne-Marie, she focused on the ideal of engaging Stephen in more academic tasks alongside his peers, such as guided reading, handwriting and phonics, although Stephen does not at present hold a pencil.

Across the course of the research Stephen had additional intervention in Attention Autism and additional phonics. This was in place during the baseline and the intervention phases.

Adult participant: Anne-Marie
Anne-Marie had worked at the setting for 19 years at the outset of the research, as a teaching assistant and as a 1-2-1 support. She had previous experience of supporting students with more challenging behaviours in the setting, and those with diagnoses of ADHD and/or Autism, but until working with Stephen, she had no experience of working with a non-verbal child. She had begun working with Stephen at the outset of this academic year, which was approximately 3 weeks prior to beginning the research. Anne-Marie had previous experience of supporting adults with mental health needs and a family member with Down Syndrome. Anne-Marie shared that she was feeling unconfident in working with Stephen.

School 3
School context: Primary school in a market town. Approximately 300 pupils on roll.

Child participant: Jackson
Jackson was aged 5 years and 2 months at the outset of the research. Chronologically Jackson was in Year 1, however the school had chosen to continue to education Jackson in the EYFS area due to the complexity of his needs. He attended the setting full time since joining in reception, and prior to primary school, attended a preschool.

Jackson was described as a cheeky young man who loves books, swimming and sensory activities. He had a diagnosis of Autism and an EHCP. He had been recently observed by an EP colleague at the EPS.

Jackson was described as not using much speech, except the odd word inconsistently. He often communicated through noises, which adults noted can be particularly noisy. His key adult described sensory sensitivities, with particular reference to the school hall, stating that in busier settings, Jackson was often louder. Setting was starting to introduce Makaton with little success.

If Jackson wanted his needs meeting, he would take an adult by the hand, however he would not always accept interaction initiated by others, depending on his mood. He found eye contact particularly difficult. Jackson was not interacting or communicating with other children in the setting.

Academically, Jackson did not follow the EYFS curriculum, and the setting were using PIVATS as an assessment tool. His key adult described that despite being at the very early stages of learning, some small steps of progress had been observed since attending the setting.

Jackson frequently appeared dysregulated, and a number of strategies were shared to have been effective in calming him down, including compression, bouncing on the yoga ball and being in the tent. His mood appeared to corelate with his ability to engage in small bits of classroom routines (e.g., sitting down for carpet briefly) or responses to interaction bids.

In terms of other interventions, Jackson engaged in Attention Autism and Singing and Sensory time prior to and during the course of the research.

Adult participant: Lydia
Lydia had worked in the setting for a little over a year, starting as a 1-2-1, working closely with Jackson when he joined reception. She knew him well. Prior to this employment, she had predominantly worked in early years and had experience working with children who had diagnoses of Autism, Down Syndrome and Cerebral Palsy.

School 4
School context: Primary school in a rural village setting, with a nursery provision on site. Approximately 400 pupils on roll.

Child participant: Joshua
Joshua was aged 4 years and 4 months at the outset of the research. He was in the reception class and attended full time. It was reported that Joshua went to a preschool prior to attending primary but could not attend full time due to the frequency and intensity of dysregulation shown. Joshua had a diagnosis of Autism and was in receipt of an EHCP.

Joshua liked playing outside and was described as a physical young man with skills in balancing. He often engaged in sensory seeking behaviours such as bouncing, flapping, running and was rarely still.

In terms of his communication and interaction, Joshua was primarily pre-verbal. He used lots of sounds and would occasionally take adults by the hand to get his needs met or hold his hands out for a hug. He was not interested in other children and preferred solitary play. He could tolerate quieter children near him, however moved away from louder individuals quickly. He was described as a sensitive to sensory input, particularly noise, however, did not tolerate headphones. He liked to chew and often put objects into his mouth. A weighted blanket was described as a good strategy to calm him down.

Joshua was often overstimulated in the classroom environment and engaged in activities such as banging his head on the floor, trying to bite himself or others. This would typically happen if he can't have what he wants straight away.

His key adult noted that she feels that Joshua's understanding was better than he would have adults believe, and that he follows simple instructions when he was more motivated. On the whole, Joshua's day to day was mostly following his own interests. Although he would have preferred to be outside all of the time, the setting were working on implementing some structure and gentle exposure to being around academic learning, ready for when he is ready to engage in it.

His key adult described how she was presently interacting with Joshua as "babbling back what he is saying", engaging in sensory activities and singing to him as he sat on her knees.

Adult participant: Liz
Liz had worked at the setting for 6 years. She had supported Joshua since he joined the setting in September. She shared this role with another 1-2-1, and between the two adults, they support two children, one in the morning, and one in the afternoon,

allowing a break between some of the more challenging behaviours which Joshua engages in.

Liz had previously supported another child with autism, and a child with autism and ADHD, both for a significant number of years. Liz shared that she had diagnoses of Autism and ADHD herself, which she felt gave her an insight into supporting children with SEND.

School 5
School context: Primary school within a small rural village setting. Approximately 90 pupils on roll.

Child participant: Levi
Levi was aged 4 years and 11 months at the outset of the research, attending the reception class. He was on a reduced timetable and had previously been on a reduced timetable at preschool and was particularly tired by the end of the week. Levi had Autism and an EHCP which provides him with full time support. It was hoped that as he continued to settle into the setting, his timetable would increase.

When Levi first joined the setting, he was very dysregulated and often flighty, trying to get through the doors to other classrooms and climbing over the fence, running across the school field. At the outset of the research, he was more settled and content in remaining in the space of the EYFS area with support and was getting used to the routines of school, however, was more passive and withdrawn.

It is reported that Levi tended to seek out quieter spaces in the classroom, despite being a small class of 8 children. He preferred to be following his own interests and was less interested in his peers.

Levi liked things which spun or rolled and looked closely at the motions made by objects such as Mobilio, or tyres and tree trunks in the garden. He also enjoyed water play and was reported to be more tolerant of peers in his space when engaged at this activity. When Levi was focused of an activity of his choosing, he was able to concentrate for a significant amount of time, as if hyper focused.

In terms of his communication and interaction skills, Levi mostly utilised echolalia or babbled. He used some language such as saying numbers aloud, and would “sing” nursery rhymes, mimicking the tones and intonation to make the tune recognisable to the listener. His interactions with adults appeared to primarily be to get his needs met. Key adults noted that he did not look towards them when speaking to him, although he could follow very simple and guided instructions, if not intently focused on his own activities. If adults used lots of language with Levi, he would leave the environment. At the outset of the research Ruth was working on being alongside him and often sang songs with him.

Levi had an operation to remove his adenoids, which was described to have impacted his development somewhat e.g., he was toilet trained but now he is in pull ups. His key adult raised the question that she was unsure how much of his presenting behaviours have been further impacted by illness and changes in routine etc.

Adult participant: Ruth
Ruth had worked at the setting for 3 years as a teaching assistant in the EYFS. She was also a 1-2-1 for Levi when he is in school, and had been working with him since he started, for a period of approximately 3 weeks.

Historically she had worked as a primary school teacher and a childminder. She had a degree in speech and language so understood how language develops. She had prior experience of supporting children with a range of SEND, including social, communication and interaction difficulties.

Appendix 14 *Pre and Post Measure Adapted SCERTS Observation Form*

Social Communication and Emotional Regulation taken from the SCERTS Observation Form: Social Partner Stage

Scoring key
2 = criterion consistently met across two partners and two contexts
1 = criterion met inconsistently or with assistance
0 = criterion not met

Social Communication

Joint Attention

1. Engages in reciprocal interaction	
Responds to bids for interaction	
Initiates bids for interaction	
Engages in brief reciprocal interaction	
Engages in extended reciprocal interaction	
2. Shares attention	
Looks towards people	
Shifts gaze between people and objects	
Follows a contact point (e.g., touching an object)	
Follow a distal point (e.g., pointing towards an object in distance)	
3. Shares emotion	
Shares negative emotion using facial expressions or vocalisations	
Shares positive emotion using facial expressions or vocalisations	
Responds to changes in partners expression of emotion	
Attunes to changes in partners expression of emotion	
4. Shares intentions to regulate the behaviour of others	
Requests desired food or objects	
Protests/refuses undesired food or objects	
Requests help or other actions	
Protests undesired actions or activities	
5. Shares intentions for social interaction	
Requests comfort	
Requests social game	
Take turns	
Greets	
Calls	
Shows off	
6. Shares intentions for joint attention	
Comments on object	
Comments on action or event	
7. Persists and repairs communication breakdowns	
Uses appropriate rate of communication for context	
Repeats communication to repair breakdowns	
Modifies communication to repair breakdowns	
Total	

Symbol Use

1. Learns by imitation of familiar actions and sounds	
Take turns by repeating own actions or sounds	

Imitates familiar actions or sounds when elicited immediately after a model	
Spontaneously imitates familiar actions or sounds immediately after a model	
Spontaneously imitates familiar actions or sounds at a later time	
2. Understands nonverbal cues in familiar activities	
Anticipates another person's action in familiar routines	
Follows situational cues in familiar activities	
Follows gestural cues other than a point	
Follows a contact point (e.g., touching an object)	
Follows a distal point (e.g., pointing towards an object in distance)	
Responds to visual cues (photographs or pictures)	
Responds to facial expression and intonation cues	
3. Uses familiar objects conventionally in play	
Uses exploratory actions on objects	
Uses familiar objects in constructive play	
Uses familiar objects conventionally toward self	
Uses familiar objects conventionally toward other	
4. Uses gestures and nonverbal means to share intentions	
Uses proximity	
Uses facial expressions	
Uses simple motor actions	
Uses conventional contact gestures e.g., give, push away, show, reach, touch, point	
Uses conventional distal gestures e.g., wave, distal reach, distal point, clap, shake or nod head	
Uses re-enactment or symbolic distal gestures	
Uses sequence of gestures or nonverbal means	
Coordinate gestures and gazes	
5. Uses vocalisations to share intentions	
Uses differentiated vocalisations	
Uses a variety of consonant and vowel combinations	
Uses words bound to routines	
Coordinates vocalisations with gaze and gestures	
6. Understands a few familiar words	
Responds to own name	
Responds to a few words in familiar social games	
Responds to a few familiar person, body part, or object names	
Responds to a few frequently used phrases in familiar routines	
Total	

Emotional Regulation

Mutual Regulation

1. Expresses range of emotions	
Expresses happiness	
Expresses sadness	
Expresses anger	
Expresses fear	
2. Responds to assistance offered by partners	
Soothes when comforted by partners	
Engages when alerted by partners	
Responds to bids for interaction	
Responds to changes in partners expression of emotions	
Attunes to changes in partners expression of emotion	
Makes choices when offered by partners	

3. Requests partners assistance to regulate state	
Shares negative emotion to seek comfort	
Shares positive emotion to seek interaction	
Requests help when frustrated	
Protests when distressed	
4. Recovers from extreme dysregulation with support from partners	
Responds to partners efforts to assist with recovery by moving away from activity	
Responds to partners use of behavioural strategies	
Responds to partners attempts to reengage in interaction or activity	
Decreases amount of time to recover from extreme dysregulation due to support from partners	
Decreases intensity of dysregulated state due to state due to support from partners	
Total	

Self- Regulation

1. Demonstrates availability for learning and interacting	
Notices people and things in the environment	
Shows interest in a variety of a sensory and social experiences	
Seeks and tolerates a variety of sensory experiences	
Initiates bids for interaction	
Engages in brief reciprocal interaction	
Engages in extended reciprocal interaction	
Responds to sensory and social experiences with differentiated emotions	
2. Uses behavioural strategies to regulate arousal level during familiar activities	
Uses behavioural strategies to regulate arousal level during solitary activities	
Uses behavioural strategies to regulate arousal level during social interactions	
Uses behavioural strategies modelled by partners to regulate arousal level	
Uses behavioural strategies to engage productively in an extended activity	
3. Regulates emotion in new and changing situations	
Anticipates another's persons actions in familiar routines	
Participates in new and changing situations	
Uses behavioural strategies to regulate arousal level in new and changing situations	
Uses behavioural strategies to regulate arousal level during transitions	
4. Recovers from extreme dysregulation by self	
Removes self from overstimulating or undesired activity	
Uses behavioural strategies to recover from extreme dysregulation	
Reengages in interaction or activity after recovery from extreme dysregulation	
Decreases amount of time to recover from extreme dysregulation	
Decreases intensity of dysregulated state	
Total	

Appendix 15 *Example Thematic Analysis for Framework Development*

Appendix 16 *SCED Repeated Measure: Early Social & Communication Skills Framework*

Communicative Methods

Subscale	1	2	3	4	5
Sounds & vocalisations (including speech)	Made very few sounds or made sounds seemingly unknowingly or with little communicative intent or meaning.	Used sounds to get basic needs met. Made simple patterns in noises e.g., repeated own sounds or sounds of others. Recognised self being imitated by others.	Used sounds to gain attention from others in a variety of ways. Began to use sounds as part of turn taking, mimicking some conversational structure.	Consistently engaged in conversation using groups of sounds or words for periods of time. Used familiar sounds for social intent, e.g., greetings, showing pleasures, interaction requests or refusal.	Used language to share experiences, feelings, preferences with others. Communicated intentions or comments on events in interaction. Used a widening repertoire of language skills e.g., intonation, turn taking, pitch, volume and pauses.
Gestures	Explored own movements but did not use gestures to knowingly communicate with others.	Used simple gestures such as pointing or reaching to gain objects or meet needs/interests.	Imitated gestures used by adult. Used gestures to draw others attention or to an activity e.g., tugging at adult's arm, guiding hand. Used gestures to signify preferences e.g., pushing adults/resources away, or to convey social meaning e.g., greetings, shaking head, nodding.	Imitated sequences of adult gestures. Used actions to request interaction, encourage adult to respond or provide enjoyable feedback. Used a variety of tactile gestures to communicate with another through repeated patterns e.g., tapping, blowing.	Consistently used a range of gestures intentionally to communicate a range of needs and interests with another person. Physical interaction is reciprocal and includes several initiations from the child.
Physical proximity	Appeared unaware or avoidant of physical proximity of others. May have reacted adversely to others being in their personal space, including moving away or vocalising their discomfort.	Tolerated and accepted others within their personal space but did not engage with physical contact. Appeared to prefer to be away from others, but not as heightened as behaviours in level 1.	Sat or stood nearby to an adult but did not actively seek physical contact or attention. Accepted some physical touch or guidance from others.	Accepted and used physical proximity e.g., took an adults hand, tapped adult, or pulled them towards them. Used gestures to encourage physical proximity e.g., beckoning or holding out arms to seek a hug. Showed brief moments of affection through physical proximity.	Frequently sought and appeared to enjoy physical contact and proximity with others during interaction e.g., smiled following physical contact. Appeared to understand physical contact as a method of communication.
Facial & visual cues *NB – this includes but is*	Used little gaze or facial cues to communicate with others or appeared	Watched others with interest. Gazed at faces and appeared to examine others during	Looked at or towards familiar adults. Copied facial expressions. Looked at	Used facial expressions and gaze to convey emotions to others or to signify preferences e.g., turned	Frequently used a range of facial expressions and gaze during interactions with others to convey

not limited to eye contact. If the child finds eye contact difficult, please note the best fit based on the other statements.	unaware of this method of communication. *Made brief eye contact unknowingly or unwillingly.*	interactions. Gaze tracked people and interesting objects. *Brief use of eye contact which appeared intentional.*	objects that they would like or that adults are showing them. *Used eye contact more frequently and sustainably with a familiar adult.*	head towards/away from stimulus. *Appeared to recognise that eye contact can be used to communicate.*	meaning, preferences experiences, and expression. *Frequently used and understood eye contact as a method of communication.*

Attention and Engagement

Subscale	1	2	3	4	5
Involvement (Leuven)	Engaged in simple, repetitive activity and appeared passive, absent, or showed little energy. May have been staring into space or extremely distracted by the environment.	Engaged in the activity for some of the time, but frequently interrupted by moments of non-activity e.g., passive or distracted by the environment.	Engaged with activity for the majority of the interaction, however at a routine level with few signs of real involvement. Did not show much energy or concentration and can be easily distracted.	Engaged in continuous activity with clear moments of intense involvement. Was not easily distracted.	Engaged in highest level of involvement throughout activity. Absorbed in interaction with high levels of energy.
Exchanges of behaviour	Mostly explored the environment alone and did not respond to others bids for interaction.	Began to respond to others interaction bids. Shared own intention for social interaction with others.	Engaged in brief reciprocal interaction. Occasionally took turns e.g., repeating actions or sounds of others.	Engaged in more extended periods of reciprocal interaction. Intentionally passed signals back and forth with adult.	Consistently engaged in genuine reciprocal interaction. Used learnt sequences of behaviours in interactions with adult e.g., exchanges previously used in interaction sessions.
Engagement	Did not show obvious awareness or willingness to be present during the interaction.	Noticed and fleetingly responded to obvious/familiar stimuli. This may have briefly interrupted own behaviours.	Attended and responded to a range of stimuli for more sustained periods of time, although inconsistently.	Consistently responded to stimuli. Anticipated familiar social routines and repeatedly presented stimuli. Participated in purposeful actions to continue interaction.	Made active efforts to consistently join in and initiate interactions with other person with social intent.
Attention	Did not seem to notice changes in the environment or	Showed an awareness to changes in the environment and	Showed brief interest to range of stimuli in environment, including people and objects. Engaged in tasks for short	Attended to activity for short period of time and was not easily distracted. Shared moments of joint attention	Maintained attention on interaction and joint activity for a sustained period of time. Showed skill in being able to shift attention and may have

	interaction bids made by others.	interaction bids, briefly responding e.g., looked towards but did not maintain attention. Very easily distracted.	periods of time, however generally independently.	with adult e.g., through comments or gaze. Was able to shift attention with support and prompts from an adult.	been able to pay attention to more than one thing at a time.

Emotional factors

Subscale	1	2	3	4	5
Wellbeing (Leuven) *NB: If the child is particularly distressed or avoidant, the interaction session should end.*	Clearly showed signs of discomfort such as crying or screaming. May have looked dejected, sad, frightened, or angry. Did not respond to the environment, avoided contact and was withdrawn.	Posture, facial expression and actions indicated that the child was not completely at ease. Signals are less explicit/intense than level 1 and the discomfort did not last the duration of the interaction.	Child had a neutral posture, showing little to no emotion. No signs which indicated sadness or pleasure, comfort, or discomfort.	Showed obvious but inconsistent signs of satisfaction, such as looking happy, cheerful, and full of energy, engaging in spontaneous and expressive actions. Appeared relaxed and did not show any signs of stress or tension. Appears assured and confident.	Engaged in the same signs of satisfaction as listed in level 4, throughout the interaction with increased intensity and consistency.
Emotional understanding & expression	Showed little understanding of own emotions. Emotional expression was typically to indicate basic needs or extreme emotions.	Expressed positive/negative emotions during an interaction to instigate change e.g., smiling when wanting something, showing frustration when interaction is unwanted. Increased awareness of emotions.	Expressed basic feelings and some understanding of what impacted their emotions. Showed some awareness of the emotions of others e.g., appeared to notice other people's facial expressions or body language and can consider what they may be feeling. Copied emotional expression shown by the adult.	Shared a range of feelings and preferences through variety of cues. Continued to show an understanding of other emotions and reacts accordingly, e.g., reacted to changes in tone of voice. Tried to evoke reactions from others using their own emotions e.g., being silly, showing surprise.	Consistently identified and expressed their own emotions. Appeared to be attuned to changes in other emotions and demonstrated an understanding of how their actions may impact others. Appeared to show some understanding of how respond to these changes appropriately.
Emotional regulation	Appeared frequently unsettled and was unable to regulate by themselves or with an adult.	Settled to activities for a short while. Child's emotions may be directed to another person to seek an	Mostly settled throughout interaction. Responded to partners attempts to co-regulate, e.g., calms when soothed and comforted and	Showed an increasing ability to self soothe and used strategies to regulate arousal levels during the interaction including removing self from	Frequently settled in the environment and appeared available for interaction in new or changing situations. Child showed increased impulse control,

	NB: the interaction should not continue if this is over an extended period.	element of co-regulation e.g., crying to an adult to share discomfort and instigate the adult to comfort them.	becomes more engaged when adults used alerting approaches.	overstimulating activity. Sought partners assistance in regulating emotions.	persistence, and resilience in the face of challenge. Strong emotions appeared less intense/ frequent, and child showed improvements in regulation.

Note. The Early Social & Communication Skills Framework has been created from the EYFS, Fundamentals of Communication, Engagement Profile, Routes for Learning, Quest for Learning, Pre Verbal-Communication Schedule, SCERTS, 7 Point Interaction Scale, FOCAL wheels, EQUALS curriculum, Leuven Scales, PIVATS. The framework draws more heavily from current assessment tools which take a linear approach such as the EYFS curriculum, Routes for Learning, Quest for Learning, PIVATS, and to some extent, the FOCAL wheels; to provide the descriptors above. It draws less heavily on assessments such as the 7 Point Interaction Scale and the Engagement Profile which focus on indicators of engagement.

Appendix 17 *Baseline Training Example*

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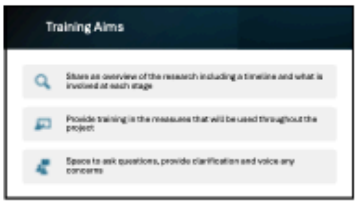

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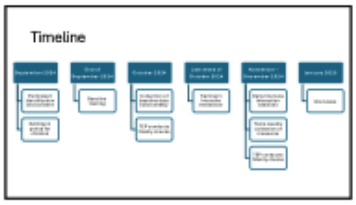

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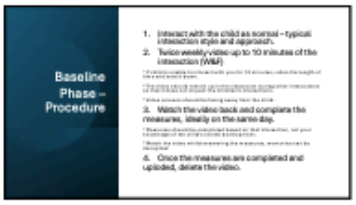

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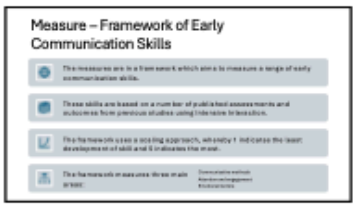

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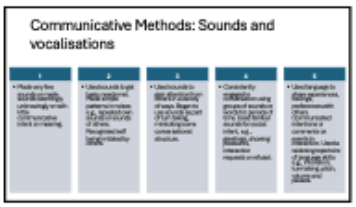

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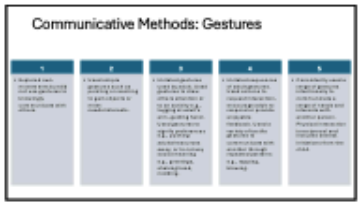

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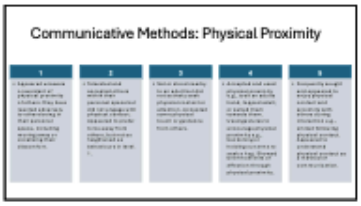

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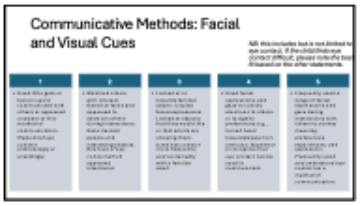

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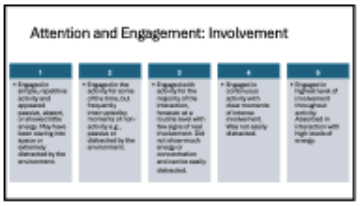

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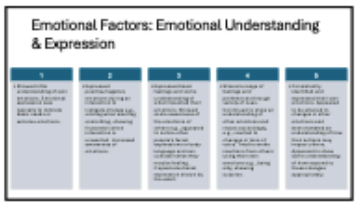

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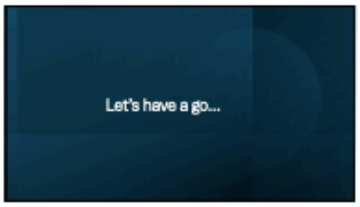

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Appendix 18 *Example of Data Collection Form*

Intensive Interaction Research Data Gathering Form

Child's Name _____ School _____
Date _____ Interaction length (mins and seconds) _____

Measures

Communicative Methods	
Sounds and vocalisations	
Gestures	
Physical proximity	
Facial and visual cues	
Total	

Attention & Engagement	
Involvement	
Exchanges of behaviour	
Engagement	
Attention	
Total	

Emotional Factors	
Wellbeing	
Emotional understanding & expression	
Emotional Regulation	
Total	

Comments

Where did the interaction take place in school?

……..……
…….

Did you notice anything particular about this interaction session? Was there anything which may have impacted/or supported the interaction? E.g., illness, particular resource etc.

……..……
…….
……
……..……
……..……
……..…….

Has the child had any absences this week or missed any intensive interaction sessions for any reason? If so, please note the dates where a session did not take place below.

……
……..……

I confirm that in completing and sending these measures, I have now deleted the video recording of the interaction.

Appendix 19 *Intervention Training Example*

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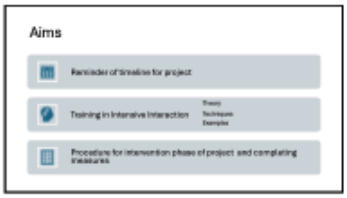

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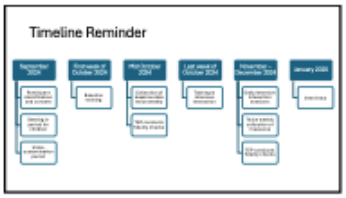

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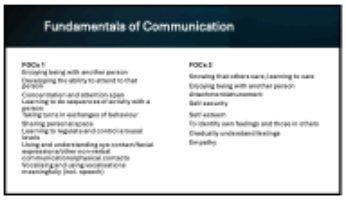

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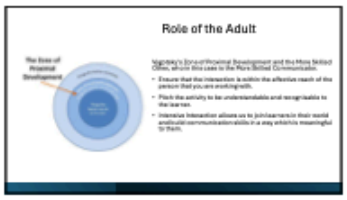

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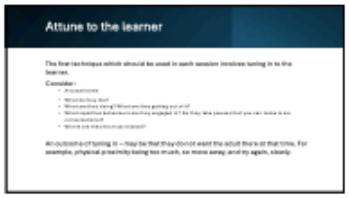

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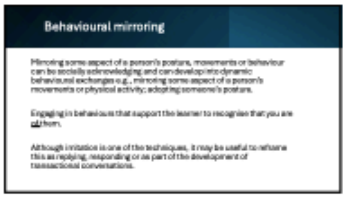

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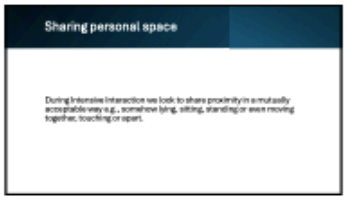

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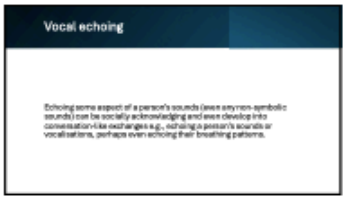

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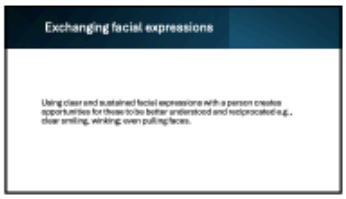

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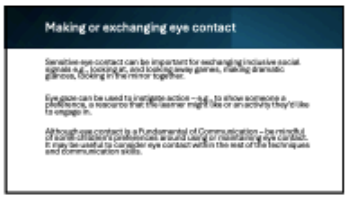

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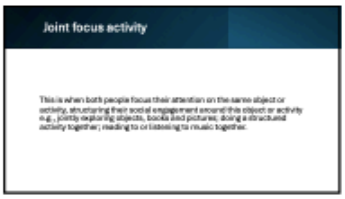

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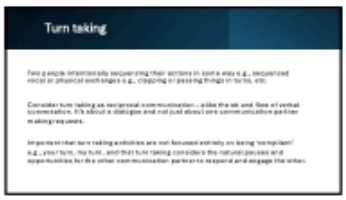

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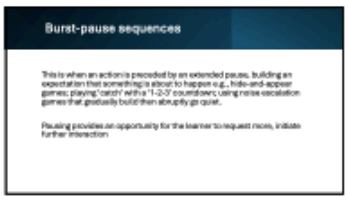

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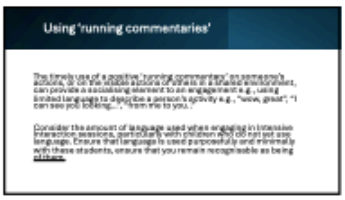

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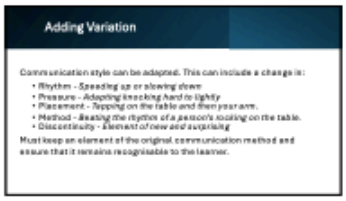

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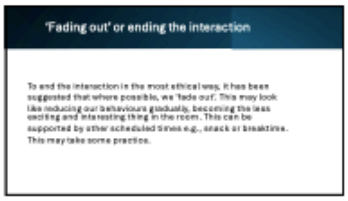

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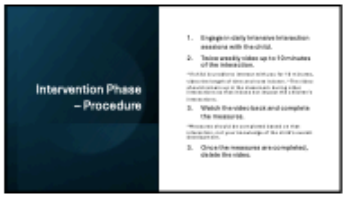

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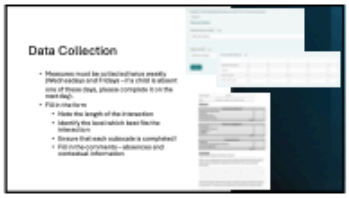

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Appendix 20 *Visual Analysis Inter-rater Reliability*

The table below describes the characteristics which have been used to visually analyse the graphs.

Characteristic	**Description of how it has been calculated in this study**
Level	The mean score for each data phases. A positive value indicates an increase in mean.
Trend	The slope of the best fitting line for the data within a phase. These have been computed using linear trend lines in Microsoft Excel.
Variability	The standard deviation of data about the line of best fit.
Immediacy of effect	Change in level between the last 3 data points of a phase and the first 3 data sets of the next phase.
Overlap	The proportion of data which overlaps across both phases.

Please look at each of the graphs and the corresponding visual analysis and complete the below table to illustrate your response to the following question:

"How certain or convinced are you that the child's scores on the subscale communicative methods/ attention & engagement/ emotional factors (delete as appropriate) underwent a notable improvement from the baseline to the intervention phase?"

For all measures/graphs an upward direction of change would indicate an improvement.

Please mark your response on the rating scale from 1 (not at all convinced) to 5 (very certain) for each graph.

		1 Not at all convinced	2 Unsure	3 It is possible	4 Reasonably certain	5 Very certain
Charlie	Graph 1: Communicative methods					
	Graph 2: Attention & Engagement					
	Graph 3: Emotional Factors					
Stephen	Graph 4: Communicative methods					
	Graph 5: Attention & Engagement					
	Graph 6: Emotional Factors					
Jackson	Graph 7: Communicative methods					
	Graph 8: Attention & Engagement					
	Graph 9: Emotional Factors					
Joshua	Graph 10: Communicative methods					
	Graph 11: Attention & Engagement					
	Graph 12: Emotional Factors					
Levi	Graph 13: Communicative methods					
	Graph 14: Attention & Engagement					
	Graph 15: Emotional Factors					

Appendix 21 *Semi-structured Interview Guide*

Introductory Comments

- Re-introductions – check how participant would like to be referred to throughout interview. Reiteration between distinction of my role as a TEP working in the service and my role as a researcher within this study.
- Remind of purpose of interview phase of the study – refer to information sheet and privacy policy provided to participants at the beginning of the study. Remind participants that they will remain anonymous in the write up of this data, both adult and child participants will be given pseudonyms, responses will be treated in confidence and only collected as part of this study, as my role as a researcher.
- Remind of right to withdraw and/or redact any discussions from the interview at the end.
- Nature of semi-structured interview. Some questions may seem unusual or difficult to answer – questions aim to cover a range of experiences in this study. Try to answer them honestly, am interested in their experiences so there is no right or wrong or any trick questions. All contributions are valued. Should any concerns be raised during the interview, we can pause at any time and/or discuss any concerns afterwards.
- Can ask questions, clarify, or give comments at any time.
- Permission to record audio and reiterate plans for data storage until transcribed.

Intensive Interaction Sessions

- Can you tell me a little bit about how the intervention went?
- How easy was it to use the approach daily in your interactions with CHILDS NAME?
- Were there any opportunities which were most beneficial in engaging in II with CHILDS NAME? E.g., times of day, activities, interests.
- Were any of the principles/techniques used more often than others? If so, why do you think that was? What did you find the most useful?

- How did you feel completing the interaction? What did it feel like for you facilitating the approach?
- How did using Intensive Interaction compare to your previous interaction styles with CHILD or other children with similar needs?
- The intervention was used for 8 weeks - Do you think that anything changed in your approach over the time period using it?
- How would you describe this intervention to someone else considering using this intervention to support children like XXXX in a mainstream school?
    - What would they need to know when starting/using this intervention with a child?

<u>Impact on child/young person</u>

- Were there any standout moments when using the intervention with CHILDS NAME?
- How did they respond to the approaches?
- What do you think the outcomes were for CHILD, if any?
    - Communication and interaction
    - Other outcomes noted during the session
    - Outcomes noticed in the wider school environment
    - Overall development
- What were the outcomes (if any) for you as their key adult using the intervention?
- How (if at all) have parents been communicated with about the progress of the intervention over time?

<u>Implementation</u>

- Were there any challenges in implementing the intervention?
    - Were these able to be navigated? How?
- What supported you in being able to complete the intervention as planned?
- Do you think anything else could have supported you in using this intervention? What would have helped the most?
- What were your experiences of using the video recording as part of the procedure in this research?

    - How did it feel watching it back?
    - Do you think this impacted your use of the intervention?
- How was your experience in using the measures?

Concluding Points

- Is there anything else you'd like to tell me about using this intervention?
- Is there anything important that we might have not talked about?
- Is there anything you'd like to clarify/revisit?
- Do you have any questions?
- Thank you for your participation – really appreciated.
- Reiterate confidentiality, consent, data storage, how to contact researcher and the right to withdraw.
- Explain analysis process and opportunity to have a summary report sent to school if they would like one following the write up of the project.

Prompts

- Can you tell me more about that?
- What worked well?
- What was most useful?
- Why, what, where, when and how?

Appendix 22 *Debrief Form*

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

School of Psychology
Debrief Form

Study Title: Investigating the use of Intensive Interaction to support children with communication and interaction needs in mainstream primary schools.

Insert Ethics Approval Number or Taught Project Archive Number

Researcher: Aimee Turlukowsky

Supervisors: Sarah Godwin

Contact Details: aimee.turlukowsky@nottingham.ac.uk

sarah.godwin@nottingham.ac.uk

The study you/your child (DELETE AS APPROPRIATE) has taken part in is investigating the use of Intensive Interaction in a mainstream primary school.

The Office for National Statistics (2023) state that the most common special educational need (SEN) during the last academic year was speech, language, and communication needs with a proportion of these students attending a mainstream setting. Intensive Interaction is an evidence-based intervention which can support individuals with a range of communication difficulties (Caldwell, 2006) using the behaviour and interests of the individual as a guide (Nind & Hewett, 2005). Caldwell (2006) describes this as 'learning the language' of the partner. It's overarching aims are to develop the fundamentals of communication by considering behaviour as intentional communication (Hewett, 2023) whilst teaching individuals that social situations can be a source of enjoyment (Nind, 1999).

Intensive Interaction has been found to have several positive outcomes, for individuals with communication and interaction difficulties (Caldwell, 2006) including improvements in relating to others, initiation/reciprocation of feedback, coping with social interactions, and developing early interaction skills such as eye gaze and joint attention (Nind, 1999). Other outcomes associated with the intervention include increased enjoyment during interactions,

attunement with adults, peer relationships, language development, and academic outcomes (Caldwell, 2006; Sharma & Firth, 2012; Nind & Thomas, 2005; Kellett, 2000; Barber, 2008; Argyropoulou & Papoudi, 2012; Mouriere & Hewett, 2012). Much of the published research undertaken in this topic is made up of singular case studies, are based in SEND or residential settings or outside of the UK. There is little research exploring the use of Intensive Interaction in mainstream settings, highlighting an important gap in the research, particularly considering proportion of children with communication and interaction needs being identified in mainstream settings, (The Office For National Statistics, 2023).

The role of key adults in facilitating Intensive Interaction sessions is imperative as they observe, reflect and respond to a pupils' behaviour in a way which supports enjoyable social interaction and develops communication skills (Nind & Thomas, 2005; Barber, 2008). Therefore, considering staff experiences in implementing the intervention is key (Hutchinson & Bodicoat, 2015). Previous research which explored staff experiences varies in terms of settings and job roles, and it has been suggested that next steps should gather perceptions from a more homogenous group of practitioners (Berridge & Hutchinson, 2020), in the case of this research study, key adults supporting children with communication and interaction needs working in mainstream primary schools.

The current study aimed to add to the current literature in this topic, by measuring the communication and interaction development of children who have accessed the intervention. In addition, the study aimed to highlight additional outcomes by interviewing the key adults who facilitated the Intensive Interaction sessions and identify any factors which supported or challenged it's use in mainstream educational settings. This evidence will be of use when developing further guidance and training in this area.

You are invited to access a summary of the research and its findings. If you would like a copy of the summary, please contact the research to indicate your interest.

Thank you for your participation in this study, it is greatly appreciated.

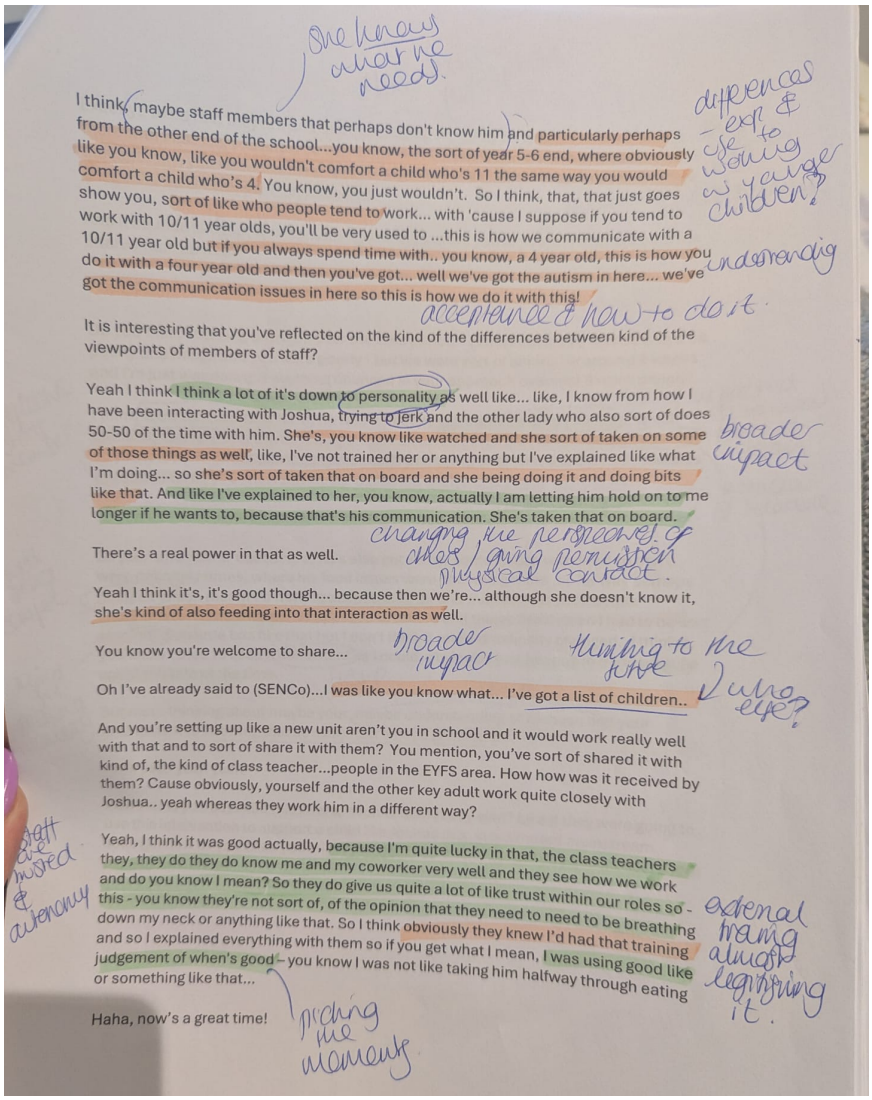
If you have any complaints about the study, please contact:
Stephen Jackson (Chair of Ethics Committee)
stephen.jackson@nottingham.ac.uk

Appendix 23 *Reflexive Diary Extracts Relating to RTA Process*

Phase 1: Familiarisation of Data

I enjoyed the process of transcribing and re-reading the quantitative data – hearing the impact of the intervention on children and the experiences of key adults in schools. Despite taking a pragmatic stance, there was a certain power to the words provided in this rich data that is not captured within the SCED data.

Certain phrases and quotes felt particularly powerful, and I must remain mindful to not become drawn to them prior to going through the sequential phases of the RTA approach.

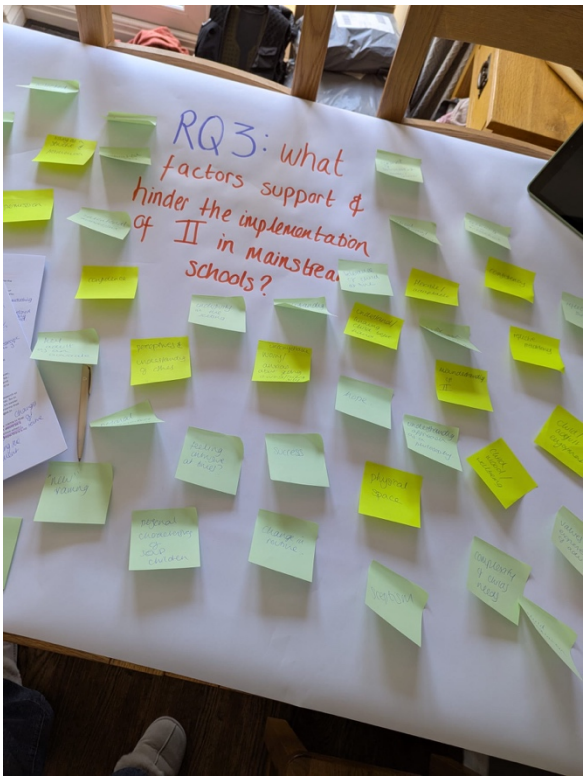


Through the familiarisation and making notes on the extracts of interest I am already beginning to note patterns such as misunderstanding of the interventions, enjoyment, tolerance etc. I am aware of the impact that my observations may have had in my perspectives of the experiences, however, by noting on extracts of interest – this ensures that the patterns are from the data, despite me potentially agreeing with some.

It is hard to not considering the underlying meanings of participants, and only analysing the explicit data, as natural you begin to consider what else they may mean, considering psychological theory. This is likely related to my other role and experiences as a TEP.

Phase 2: Coding

During this step, I found that I had created a substantial number of initial codes which was overwhelming and daunting to then continue with the process. This may however have been due to the emotional overwhelm of doing this type of analysis for the first time, and the pressures of doing so for a significant degree in my career.



What I found helped me with this was to come away from the 'coding process' and re-immerse myself in the interviews and talk about the codes and process aloud to another person familiar with RTA. It was also helpful to be able to see the codes and move them around. I worried that I was over coding the data for the first research question and benefitted from going back a step. At the stage of coding, I could see where overlaps and patterns were already beginning to form and struggled to be patient and trust the process of RTA.

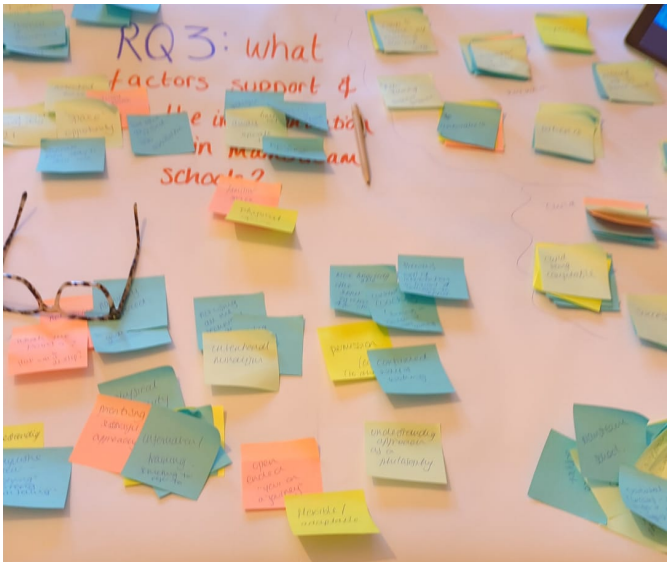
Although I was conducting RTA on a semantic level, I frequently recognised that I was falling into analysing on a latent level and considering the emotions behind the words. This is likely due to how the research has been designed and the frequent involvements which I have had, alongside conducting the interviews and transcription myself. In this way, I heard and witnessed the emotions in key adults voices as they spoke, particularly about their experiences, and this is something that is difficult to put aside. I wonder how much you can really analyse the date on a fully semantic level.

Interestingly, during peer supervision, they disagreed with some of my codes, which highlighted the impact of each of our subjective experiences and the impact which this can have on RTA, and how the researcher is naturally co-constructing alongside the participants in constructivist research.

Phase 3: Generating Initial Themes

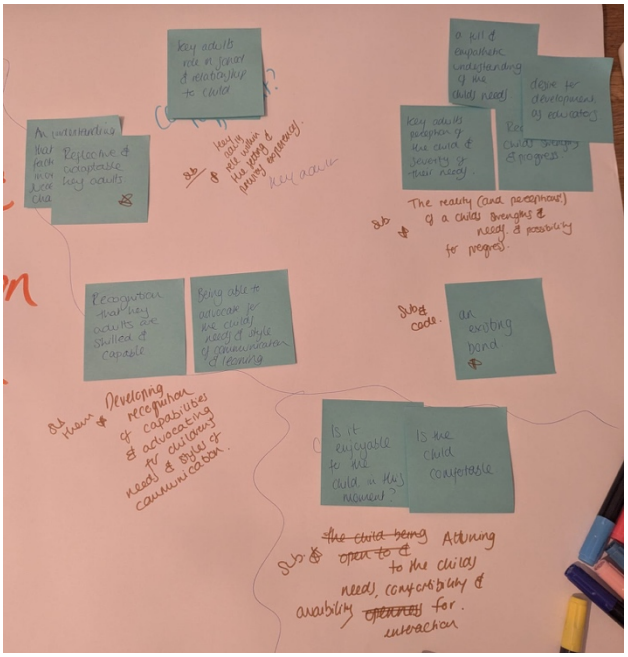
I underestimated how long this would take and the desire for me to feel as though I had gotten it 'right'. Codes and data extracted were organised and reorganised into themes multiple times, and seeing how each theme naturally somewhat overlaps and links together made it harder to then find the boundary of each and ensure that they were distinct.

Peer supervision was helpful just to explain my thinking and to see if the code progression made sense. As I had coded so much of the data, naturally codes were removed during this process due to limited data or it not appearing relevant to the research question. This was hard as I wanted to cover everything and all the data.



Phase 4: Developing and Revisiting Themes

Multiple changes were made at this point. I could see where I had made tentative links which made sense to me – i.e., adults being skilled and capable, which links to their ability to being able to advocate for children's needs – however, I realised that this was too multifaceted to be a singular theme – which then led to reorganising many of themes across the entire research question.



Phase 5: Refining, Defining and Naming Themes

The naming process went through several iterations (see each RQ map with comments). Some themes were large and benefitted from adding subthemes. For example, considering the environmental context. I do wonder the extent to which my role as a TEP and my desire to convey the specifics around intervention implantation in an accessible way, not only for the reader, but also to ensure that the findings can be easily translated to real-life practice.

Phase 6: Writing up

I quickly regretted creating electronic thematic maps prior to completing the write up of each RQ, as I naturally found myself changing things as I thought about sharing the themes with the reader, identifying where things perhaps were not clear, or where overlaps were evident.

Linking back to the impact of the qualitative aspect of this research, this was clear in my difficulties to reduce the quotes in this section and only pick ones which were key, or which effectively conveyed the theme. Interestingly, in the process of the write up, I wondered how much I was privileging eloquent voices? What I mean by this, is I noted that the same two participants were often the ones whose quotes appeared to reflect the themes most succinctly. This led me to check through the

transcriptions of the data from all participants and to ensure that the experiences of all were being shared. On reflection, I think that this was purely due to the way they shared their experiences and the impact which some of their quotes had on me reading them.

Appendix 24 *Thematic Maps with Reflexive Comments*

RQ1: What are the outcomes of using Intensive Interaction on early communication skills?

Initial codes	Code	Theme	Reflexive Comments
Noticing	Being recognisable	**Moments of development: At their pace and on their terms**	It felt important to recognise that despite many positive outcomes within the interviews - these did not appear linear and were often incidental which adults found frustrating when engaging in an intervention in the hopes of supporting a child's development in this area. Many participants provided reasons which appeared to explain these moments of success - which focused on the child-led underpinnings of the philosophy. On reflection, although grounded in the data this may have somewhat been impacted by my view observations of the Intensive Interaction - which sessions were and were not successful. My personal experiences in using Intensive Interaction within schools and with individuals with SC&I needs highlighted the importance of 'being recognisable'.
At his level ZPD			
"we're the same"			
At their pace			
New – child initially avoidant Didn't like it	Development over time		
Natural development			
"Towards the end"			
Moments	Outcomes feeling inconsistent		
Flashes			
Inconsistent language			
Occasions where resistant or disappeared			
On their terms	Child autonomy		
Autonomy			
"Telling his story"	Affirming the child's sense of self	**Success breeds success**	Participants spoke about the successes of the intervention with delight and disbelief. Although this aspect of the theme relates more closely to the research question of
Self-identity			
confidence			

To use his voice			outcomes relating to communication for individuals, from a social significance POV, the impact which the intervention could potentially have on the broader school community was important to consider. This made me wonder whether by experiencing success, adults became more motivated to continue the intervention and share the use more broadly. This is likely linked to my understanding of Self-Determination Theory and psychological underpinnings of motivation through my academic training and qualifications. There is some overlap identified within this theme and the following theme in relation to communication and the code 'understanding the purpose of communication'. However, my knowledge of early communication development and pseudo dialogues fits closer with the idea of success. Arguably much of the themes will overlap with the next, due to the research question/phenomena of interest.
Come on a really long way	Making leaps		
progress			
Huge steps of progress			
disbelief			
Looking to the future	Looking to the future across the whole school community		
The broader impact this could have on other children			
How can we involve others to support inclusivity?			
Developing understanding across the setting			
Success	Interaction can be enjoyable		
Play with him the way he wants to be played with			
Learnt it might be enjoyable. Less suspicious			
Child enjoying the interaction			
Laughing			
2 way understanding			

Empathy for one another?	Understanding the purpose of communication		
Understand the purpose of communication			
Sharing wants needs and interests			
Anticipating interactions	Anticipating interactions	**Observed progress in communication skills**	This theme could be perceived as being too broad. I had difficulties in naming this theme, as arguably there are links with many of the other themes. From a psychological perspective, progress in communication skills could include many of the codes within this RTA due to the links with emotional connection and relationships. During peer supervision, my colleague suggested considering this theme as 'reciprocal communication'. I disagreed with this, as due to my extensive immersion in the data and interviews, the codes did not always suggest that these steps of progression were reciprocal. This highlights the subjective nature of RTA and the impact which my understanding of communication development has likely had on the RTA process, despite attempting to remain objective.
Joint focus	Developing attention skills		
Longer interactions			
Longer attention and engagement			
Instigated	Initiating interactions		
Increased use of his way of communicating			
Sharing wants needs and interests			
Making and exchanging eye contact	Increased non-verbal communication behaviours		
Physical proximity			
Tactile/use of touch			
Facial gaze			
Improved speech	Increased verbal communication		
Use of words			

Mimicking			
Continuing the conversation	Reciprocal "conversations"		
Building			
"carry on"			
More tolerant	Increased tolerance	**More settled in the school environment**	Initially, the codes within this theme and the following were one theme, however at the point of revising themes in phase 4, these were separated as the ideas were felt to be too diverse. Although I understand that the two are interlinked, they are separate outcomes which were clear within this data. The second code within this theme was initially focused on the concept of being more settled, however, on reflection this was too broad as a singular piece of information. At this point, the recursive nature of RTA was evident as I moved from Phase 4 to Phase 2, and back to coding. Being settled was identified as a broader theme which encompassed multiple codes.
Window of tolerance			
More accepting			
Settled in school	Improved emotional regulation		
Difference in emotional regulation			
Happy and settled			
More accepting of coregulation?			
More often socialising with peers	Interest in socialising with others	**Meaningful relationships and school belonging: Are we being inclusive?**	This theme aimed to identify the outcomes of Intensive Interaction in developing relationships within the school environment, however it also encompasses the alternative view that although the intervention supported relationship development, there was a sense of exclusion in the process of delivering the intervention. In my reflections of the data, I wondered how isolated the adults felt in delivering the intervention alone and frequently separate
Accepting interaction from other adults			
Trying to understand others?			

Inclusion	What is true inclusion?		from the rest of the school environment. Similarly, the language which adults used appeared to reflect an element of power imbalance within any relationships that did develop, with adults using phrases like "make him" when talking about the interactions which CYP had with their peers. I wonder if to an extent this reflects the naturally latent level of analysis despite choosing to analyse data on a semantic level. Through peer supervision, the extent to which the codes within this theme and another were considered - particularly 'interest in others' and 'communication being enjoyable'. I felt that there was a distinction between being interested by interactions and succeeding in interactions, however the peer supervision afforded an opportunity to discuss this difference and develop my understanding of it.
Being alone			
Peer relationships – 'make him'			
Connection	Developing a meaningful relationship with key adults		
Relationship			
Togetherness			
Time together			
Bond			
Trust			
Having someone close by			
Affection			
Physical touch			
Loving			

RQ2: What are teaching staff's experiences of using Intensive Interaction with young people in mainstream schools?

Initial Codes	Codes	Themes	Reflexive Comments
Enjoyment	Enjoying quality time together	**Effortless connection**	There is some overlap between the codes of second nature and nurturing - however this is likely linked to my understanding of child development through my professional roles/academic training as an Early Years Teacher, SENCo, Assistant Psychologist and TEP.
Our time			
Fun			
Quality time following child agenda			

Loved it/positive feedback around II			The code 'second nature', perhaps doesn't cover the initial code of not being a stand-alone intervention - however this is covered within RQ3 and perhaps less important when considering the key adults view of the Intensive Interaction.
Nurturing	Nurturing and affectionate		
Loving			
Therapeutic			
Caring			
Confirming	Affirming and confirmatory – this is how we should be working		
Makes sense			
Framework giving name and permission			
Permission from others			
Easy/Easier than you think	Second nature		
Natural			
This is my job? Normal interaction			
Became the norm and routine			
Using more frequently and subconsciously			
A way of being			
Not stand-alone intervention			
Give it a go	Optimism	**Driven to succeed**	Initially I considered the theme of 'growth mindset' for naming this theme, however I feel it has connotations that perhaps did not reflect the motivation within their experiences. Interviews highlighted the desire staff had to see progress in the children which they were working with
Trust the process			
Hopeful to see success			
Pride of work	Pride of work		
Seeing progress			

Celebratory			- and I wonder how much of this is linked to their roles as educational staff and their view of their roles. This may also reflect my own desire to see developmental change in children, however, also raises the question of moral ethics from a positive neurodiversity perspective.
Focused	Focused		
Absorbed			
Interested			
Zoning in			
Trying something new	Motivated		
Interested/excited and curious – does it work?			
A challenge - positive			
Seeing success			
Thinking ahead to the future – what else?			
A challenge – negative – views on pupil	Is this going to work?	**This isn't going to work here**	Although many adults appeared to change their view following the conclusion of the intervention, (see final code and comments), it was important to highlight the scepticism which many staff felt regarding Intensive Interaction and the possibility that it would work in their setting and have a positive impact on the child. A reflection which I had as a professional supporting SEND in schools, was how much this potentially reflected the frustrations of staff who perhaps felt that the children they are supporting, with complex needs, would be best placed in a SEND setting, and the overall frustration with a system which is currently not working as well as we would like. Many of the staff found the overall philosophy of the approach, particularly the task-less approach really frustrating and difficult to accept. I reflected on the training which I provided staff at this point and thought
Rigid perspective			
Walls up			
Scepticism			
Disappointed	Pointless and frustrating		
Frustrated at slow progress			
Inconsistent outcomes			
What's the end goal?			

			about how this was presented. In my planning and preparation for this research I spoke to someone at the Intensive Interaction Institute, who talked about the task-less nature and overall philosophy of the approach, which when then presenting it to a school as an evidence-based intervention, becomes somewhat muddied. This is also likely impacted by my experiences in delivering training to staff in Intensive Interaction previously, and the broad range of perspectives of staff when being presented with the approach, which at times, has included scepticism.
Isolating?	Isolating	**Isolating and anxiety provoking**	For this theme and coding, it was important to convey the negative emotions which the experience of using Intensive Interaction raised in key adults. Although this is a somewhat narrow theme, I wonder if it reflects the extent to which this view was felt across the participants, as not everyone shared this.
Separate			
Feeling silly	Feeling uncomfortable		
Strange and unusual			
At risk of judgement			
Cautious – due to challenging/complex behaviours of child	Underlying anxiety		
Tentative			
Wanting to get it right			
Anxiety			
Worry about impact on others			
Hypothesising	Reflective	**An opportunity to learn and reflect**	I wonder how much this theme encompasses the limited opportunities for CPD and time for reflection in busy mainstream schools? Perhaps the procedure which the
Reflecting back on the sessions			

Considering the environment more frequently			schools agreed to, provided this for staff who have not experienced it for a short period? There is some overlap with the theme 'driven to succeed', however this comes from a learning POV, focusing on the development of experience and skills of the key adults. I have naturally however made slightly less around the confidence building nature of this theme. I wonder if this is due to the voices of those who felt less confident, which somewhat diminished the views of those who felt they could celebrate their skills. Or perhaps this was about the quantity of confidence which adults were able to acknowledge, compared to the reflection and learning?
Reflecting on use of techniques and developing understanding of II			
Developing understanding of ASD	A learning experience		
Understanding of child's needs/communication style			
Developing personalised curriculum			
Acknowledging own skill set – pride	Confidence building		
Developing confidence			
Increased skills – CPD			
Becoming more confident and comfortable over time			
Needs limited resources	'Easy' compared to other interventions	**Changing and challenging perspectives**	Naturally this theme has some overlap with positives and negatives picked out throughout the themes relating to this RQ. This theme is particularly significant due to the perspectives that changed across the course of the intervention and furthermore provided key adults taking part the confidence to challenge others. I considered the potential power dynamics which these supporting staff may experience in their job role - in relation to how they may work with their colleagues and
Reduces pressure in a busy school			
Different	A new perspective		
Change in perspective			
No longer taking the mickey			
Scepticism	Disbelief		
Surprise			
Encouraging to see success			

Taking on a leadership/training role	An opportunity to share knowledge		how working with a TEP who they may perceive has more experience, would likely make challenging any perspectives of others really difficult. Having worked in supportive roles myself, I can empathise with the potential for power dynamics for key adults taking part. This was also hard to manage at times where I felt the staff required more support or training, and it felt difficult to balance the 'critical friend' and the consideration of power dynamics.
Sharing info with others			
Trying to encourage others to be receptive	Challenging other's perceptions		
Developing key child's relationships with others			
Advocating for the student			
Misconceptions			
Prioritising this over other tasks	Conflicting views		
Disconnect with values			
Letting go of the agenda – child led feeling alien			

RQ3: What factors are perceived to support and hinder the implementation of Intensive Interaction in mainstream schools?

Initial Codes	Codes	Subthemes	Themes	Reflexive comments
Focus on academic learning	School agenda policies and expectations	N/A		In creating this theme, I considered the likelihood that these settings were more likely to be inclusive and prioritise CPD/interventions due to the agreement in taking part in the research. This will be discussed
"Mainstream school"				
Losing time				
Impact on others				
Others understanding the purpose	Perspectives and acceptance of others			
Support of class teacher				

SENCO support			**The school community: Values, and expectations**	further within the discussion section. Many participants focused on the overall and ideal agenda of school being a place for academic learning, which is somewhat conflicting with the next stage of development for the cohort of children that this intervention is aimed at.
Acceptance of way of working				
Supportive workplace environment	A supportive and inclusive setting			
Inclusivity in the setting				
Positive relationships with other staff				
Inclusive – values individual differences and strengths				
Impact on others?				
Resources and activities	Physical resources	**Resources? The adult is key**	**Environmental context: What do I need?**	This theme aimed to consider the specifics of what would be needed in the moment of delivering the intervention. It is recognised that for some subthemes - particularly the one regarding resources - this does reflect my own personal view, that resources are not necessarily needed and should be used intentionally, however this was reflected in the comments by the majority of participants.
You only need an adult - nothing to set up	Only needs a key adult			
Prioritised	Availability	**Time, space and opportunity**		
Protected time				
School diary and routine				
'space' opportunity				
Reduced timetable?				
Staff availability				
Time together				
Physical space	Physical space			
Illness	Breaks interrupting the flow	**Consistent delivery**		
Breaks				
Short & frequent				
Routine/ child expectation				

Building it into routine	Building it into routine			On an initial iteration of themes, this was initially one large theme with no subthemes, however in order to best convey the specifics in an accessible way which was not broadly under 'environmental context' - this was revised into the current subthemes.
Quiet/calmer	Environmental considerations	**Consider the current context**		
Away from the classroom				
Busyness				
Free flow				
Environment vs curriculum time				
Ability to focus				
Less distracting				
Can be done in flexible environment				
Trust between them	An existing bond	**An existing bond**	**Individual differences within and between communication partners**	Initially I considered two separate themes consisting of the individual differences of the child and the individual differences of the key adult facilitating the intervention. When organising the codes, it was evident that the individual differences were most pertinently about the adult and their characteristics than that of the child. The main subtheme which considered the child more specifically was the need to attune to the child's needs,
Relationship				
Comfortability	Is this enjoyable for the child, in this moment?	**Attuning to the child's needs, comfortability and availability for interaction**		
Not liking it				
Intrusive at times?				
Enjoyable				
Increased pleasure and time engaging with an adult				
Child regulation	Is the child comfortable?			
Settled				
Basic needs being met				
Changes in setting/routine?				
Safe and secure				
Wellbeing				

Mood, tolerance & regulation				however during data analysis, it became clear that this factor was impacted by the key adult's ability to notice and adapt to those needs. On reflection, this theme was somewhat apparent throughout the course of the mixed methods research, as the adult's differences in perspectives, experiences and personal characteristics appeared to be prevalent from the SCED, however the data gathered during the interviews also highlighted this.
Hope	Desire for development as educators	**The reality (and perceptions!) of a child's strengths, needs and the potential for change**		
Motivation				
Desire to see child development				
Characteristics	Key adults perceptions of child and their needs			
Complexity of needs				
What they can do	Recognising a child's strengths and progress			
Success				
When not seeing success				
Seeing progress				
Celebrate and notice improvements				
Observing outcomes				
Sensory	A full and empathetic understanding of the child's needs			
Knowing them before				
Neurodivergence				
Understanding communication style				
Expectations of support	Role in school and relationship to child	**Key adults role within the setting and their previous experiences**		
Seeing child everyday				
1-2-1				
Teaching assistant				
Separate from day to day role				
Inclusive or isolating?				
Away/time out/ separate				

SEND EYFS	Previous experience and preferred ways of working			
Advocacy	Advocating for the child's needs and communication style	**Having the skills and knowledge to advocate for children's SEND**		
Confidence Recognising strengths The adult placing an importance on their role ONLY need adult Child NEEDs you to Self-doubt Autonomy and trust in judgement from others	Recognising key adults as skilled and capable			
Training providing a structure and a framework	II providing a framework	**Help! Having something or someone to refer to**	**Using Intensive Interaction authentically**	This theme was initially much broader and included factors which were since moved into the 'buy in' factor – including the permission and legitimisation of the approach and the understanding of the approach. At the write up stage, these were reorganised.
Concrete examples - videos	Concrete resources/ information			
Infor/training something to refer to				
Previous experience in school and staff to support				

Catch up with researcher	A more knowledgeable other			
Coaching				
Asking for help				
SENCo support				
Persevere	Being reflective and intentional with approaches	**Making best use of specific techniques**		
Intentional minimalism				
Patience				
Attunement				
Taking a step back				
Not using all the techniques at once				
Natural	Allowing outcomes to occur naturally			
Not forcing outcomes				
Misunderstanding of II approaches	Misunderstanding of techniques and principles			
Not standalone	Using II as part of a personalised curriculum	**Individualising the approach for each child with social, communication and interaction needs**		
Personalised curriculum				
Personal characteristics/ preferences/interests	Utilising a child's communication style to be recognisable			
Being recognisable				
Not all techniques work for all				

Prioritising successful approaches				
The stars aligned Not a catch all Adaptable/ flexible intervention	An understanding that factors can increase/decrease success	N/A	**Factors can only increase success - 'challenges are not insurmountable'**	I acknowledge that this theme is specific and was not something that was collated across all participants views, however around half of the participants referenced this explicitly and it is felt that this is an important consideration when considering the helping and hindering factors when utilising the approach in mainstream primary schools.
New and interesting Different perspective Motivation Valuing CPD	Motivated by a 'new' approach	**Key adult's perspectives of Intensive Interaction and the emotions it can raise**	**'Buy in'**	There is some overlap between the codes and building blocks within this theme and the theme of individual differences – due to the key adults perspectives. As this particular subtheme was more closely related to Intensive Interaction – this is why this is separate to the individual differences theme above. I recognise that all of the codes and themes within this RTA are
Scepticism Will this work?	Scepticism			
Willingness to try Worried about judgement from others Uncomfortable/anxious/scared Worried about getting it wrong	Anxiety: What if I get it wrong or people judge me?			

Frustrating	Varied levels of enjoyment			likely to be impacted by the recruitment strategy in the research. Schools chose to take part, having an understanding of the intervention/research procedure and what would be required of them. 2 schools dropped out due to this information. This suggests that the schools who agreed to take part may have naturally been more 'set up' for the intervention and could afford the time and resources (although limited) for its success. Therefore, it is likely that the findings from this research question are slightly skewed, highlighting a limitation in the research.
Ambivalence				
Enjoyment				
School that values CPD	Prioritising SEND interventions and CPD	**The intervention being prioritised by the setting**		
Not being prioritised				
Just another training				
How will it develop?	What's the point?	**A nuanced understanding of II**		
Theres no clear outcomes/goals				
Understanding as a philosophy	Understanding of Intensive Interaction approaches			
A way of being				
Misunderstanding of II approaches				
External training legitimising it	Having permission	**Getting permission and legitimising the approach**		
"professional" permission				
Confirmed ways of working				
Training providing a structure and a framework	Intensive Interaction providing a framework			

Appendix 25 *Ethical Approval Letter*

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SJ/tp

Ref: S1611R

Tuesday 11th June 2024

Dear Aimee Turlukowsky & Sarah Godwin

Ethics Committee Review

Thank you for submitting an account of your proposed research 'Investigating the use of Intensive Interaction to support children with communication and interaction needs in mainstream primary schools.

That proposal has now been reviewed and we are pleased to tell you it has met with the Committee's approval.

However:
Please note the following comments from our reviewers.

Reviewer One:

- Thank you for making these changes. The only last suggestion I would make is to ensure that the materials highlight that videos will be recorded in a school device. For example, this could go in the information sheet, for example, "videos will be recorded using a password-protected school-owned device" or something in these lines. This should be in the information sheet for both the guardians and the key adult.
- In the recruitment email where it says "These videos will need to be taken on a device such as a school tablet or similar and ensure that the child is fully in view." The wording here is a bit ambiguous with the "school tablet" being list as an example, as opposed to a necessity. The wording should be made stronger, for example: "These videos will need to be taken on a password-protected school device such as a tablet or similar and ensure that the child is fully in view.
- In the consent form for the key adult, again, "Video record the intervention session twice a week to support the completion of measures"… "using a password-protected school-owned device".
- Basically I think it's important to ensure that these videos will be treated with the same level of data protection as any other data we capture in our studies. When debriefing the key adult make sure they are aware of this rule and that there is no consequence if they delete the file and it is subsequently needed. (for example, that you won't come back to them to say that they transcribed it incorrectly and that you want to check the video again – that this would never happen and deleting the video is more important than any need of going back to it later).
- Also it is not clear who is going to destroy the paper copies of the form, please have a procedure in place to ensure that this happens.

Independently of the Ethics Committee procedures, supervisors also have responsibilities for the risk assessment of projects as detailed in the safety pages of the University web site.

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Ethics Committee approval does not alter, replace, or remove those responsibilities, nor does it certify that they have been met.
Yours sincerely

Professor Stephen Jackson
Chair, Ethics Committee

Appendix 26 *Researcher Positionality Statement*

The researcher's interest in this research project initially stemmed from their professional experiences. During the early stages of their career, the researcher worked at a private day nursery catering for children from 6 months to 11 years of age, due to after-school and holiday clubs run in collaboration with local schools. In this role, the researcher worked with a range of age groups and developed an understanding of the importance of communication to develop meaningful relationships with others and to develop educationally. They worked with children with a variety of special educational needs and disabilities (SEND) and observed the impact that difficulties in communication could have on a child's development.

Over time, the researcher undertook Early Years Teacher training and subsequently assumed the role of Head of the Pre-school. This position required monitoring and supporting children's progress, including in communication and interaction. The role also involved liaising with external professionals, such as Speech and Language Therapists (SALT), Early Years Specialist Teachers, and the nursery SENCo. Additionally, the researcher collaborated with teachers at local primary schools to support transition and 'school readiness'. Teachers often discussed the challenges faced by children with communication and interaction needs during their early school years.

The researcher's interest in this topic deepened through continued professional training and growing experience. By undertaking SENCo training and becoming Assistant SENCo while continuing to lead the Pre-school, enabled the researcher to support children in their care and enhance colleagues' understanding of communication needs.

Following their interest in Educational Psychology, the researcher worked as an Assistant Psychologist at a private Educational Psychology service. It was in this role that they were first introduced to Intensive Interaction as an approach, and they observed first-hand how individuals with social communication and interaction (SC&I) needs responded to it. For example, a 16-year-old autistic male, who previously did not engage with adults, extending his arm to request more hand massage, and the visible surprise of a 4-year-old when an adult joined his method of communication — clapping. The researcher recognises that they may hold assumptions about the efficacy of Intensive Interaction based on these experiences, as well as their academic training as a Trainee Educational Psychologist (TEP), during which their interest in communication and interaction continued to grow.

While the researcher acknowledges that their prior experiences and interest in this area may bias their views regarding the prevalence and impact of communication and interaction needs in educational settings, they note that throughout their Doctorate Training in their role as a TEP, schools frequently sought support for pupils

with these specific needs. This aligns with national statistics on the prevalence of Communication and Interaction needs in education.

The researcher approaches this study with an awareness that their role as a researcher and their academic background may carry unspoken power dynamics, specifically when working with support staff within education. This awareness is informed by the researcher's own lived experience as an 'unqualified' member of staff in a private nursery prior to completing professional training. That experience instilled a strong sensitivity to the ways power dynamics can affect relationships — a consideration throughout this research, particularly during the training provided to staff. The researcher felt it was important to recognise and celebrate the strengths of staff, especially their understanding of the unique communication styles of the children they supported, while also enhancing their knowledge of the intervention and the psychological theory behind it.

Despite this intention, the researcher acknowledges that their academic training and professional experiences may result in implicit biases. Through this positionality statement, regular supervision with colleagues, peers, and university tutors, and the use of a reflexive diary (see Appendices 23 & 24 for extracts), the researcher aims to contribute ethically and thoughtfully to the limited research on Intensive Interaction as a means of supporting children with SC&I needs.