
# An evaluation of the effectiveness of the Attention Autism intervention on the joint attention and joint engagement of autistic children in Ireland

**Niamh Moore**

Supervisors: Professor Emer Ring, Dr. Lisha O' Sullivan and Professor Eugene Wall

Doctoral Thesis submitted in partial fulfilment of the requirements for the award of Doctorate in Education and Child Psychology

Submitted to Mary Immaculate College

August 2020

# ‘An evaluation of the effectiveness of the Attention Autism intervention on the joint attention and joint engagement of autistic children in Ireland’

**Niamh Moore**

## Abstract

**Background:** Joint attention and joint engagement difficulties are considered core deficits associated with Autism Spectrum Disorder (ASD). Current literature indicates that acquisition of joint attention abilities are a prognostic indicator for autistic children in the areas of social interaction, language, and cognition. Studies of parent-mediated and researcher-mediated joint attention interventions have reported positive outcomes. Although the absence of joint attention skills amongst children is hugely inhibiting, in an educational context, there is limited research on the use of joint attention interventions in the school setting, particularly within an Irish context.

**Aims:** The purpose of this quasi-experimental study was to evaluate the efficacy of the social-communication intervention Attention Autism (Davies, 2013), within the school context, on the joint attention and joint engagement abilities of autistic children.

**Sample:** A total of four special classes, catering specifically for autistic children aged three to seven years ($n$=20), and their teachers participated in this study. Participating children were pre-verbal with limited receptive language.

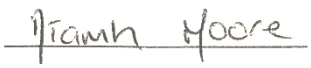
**Method:** A quasi-experimental pre-test post-test design was utilised. Two classrooms ($n$ = 10) implemented the Attention Autism intervention, for a period of six weeks. The intervention was carried out by the class teachers, who had received training in the intervention. The remaining two classrooms ($n$ = 10) acted as treatment-as-usual groups.

**Results:** Results indicate that children in the intervention group improved significantly over the control group, on certain behaviours. Children in the intervention group demonstrated greater initiation of joint attention and response to joint attention behaviours on the structured joint attention assessment and greater frequency of joint attention behaviours in the classroom setting. Some positive trends in joint engagement were also noted for the intervention group.

**Conclusion:** This small scale study provides promising data on the effectiveness of the Attention Autism intervention in improving the joint attention skills of autistic children in the school setting.

## Declaration

I, Niamh Moore, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.



Niamh Moore

Word Count: 30, 848

**Acknowledgements**

First and foremost, I would like to thank the participants of this study. Thank you to the children, parents, teachers, and principals for volunteering their time.

I am eternally grateful to my siblings Claire, Brendan, Brian, Áine, and Éimear who even on the darkest of days managed to make me smile. You were a constant source of fun and laughter throughout this journey. I wish to thank my parents who I owe my every success. Thank you for your never-ending support and your constant belief. I know how hard you have both worked to ensure that nothing is out of our reach. To my father Brendan, no one can make me laugh quite like you. Thank you for using your humour to help me through the tough days. To my mother, Bridie, thank you for the late-night chats, the tea, and the beautiful food. Although I now worry about my transition back to adulthood, know that I could not have done this without you. As a token of my appreciation to you all, I solemnly promise to never mention my thesis again!

To my partner, Clive, thank you for your love, support, and patience always.

My most sincere thanks to my supervisors Professor Emer Ring and Dr. Lisha O'Sullivan. Thank you for your interest, enthusiasm encouragement, and your willingness to share your knowledge and expertise throughout this journey. I could not have envisioned a better team to support me. I am truly grateful for your time and commitment to my thesis from beginning to end. Thank you to Professor Eugene Wall, your knowledge and expertise were greatly appreciated. A special thanks is also owed to Dr. Margaret Farrelly for encouraging my interest in the area on my first disability placement in 2017.

## Dedication

*For Mossie & Granny Moore*

## Table of Contents

## List of Tables

## List of Figures

## Appendices

## List of Acronyms and Abbreviations

| | |
|---|---|
| AA | Attention Autism |
| ABA | Applied Behaviour Analysis |
| ABLLS | Assessment of Basic Language and Learning Skills |
| ADIR-R | Autism Diagnostic Interview-Revised |
| ADOS | Autism Diagnostic Observation Schedule |
| AIM | Access and Inclusion Model |
| ANOVA | Analysis of Variance |
| ASAP | Advancing Social-Communication and Play |
| APA | American Psychiatric Association |
| APA | American Psychological Association |
| ASD | Autism Spectrum Difference |
| BAS-3 | British Ability Scale 3rd Edition |
| BERA | British Educational Research Association |
| C-ABA | Contemporary-Applied Behaviour Analysis |
| CECDE | Centre for Early Childhood Development and Education |
| CIPP Model | Context Input Process Product Model |
| CPD | Continuing Professional Development |
| CPI | Classroom Practice Inventory |
| CT | Circle Time |

| | |
|---|---|
| DCYA | Department of Children and Youth Affairs |
| DENI | Department of Education Northern Ireland |
| DES | Department of Education and Science (Ireland) |
| DES | Department of Education and Skills (Ireland) |

The Department of Education was renamed the Department of Education and Science (DES) in 1997, and again renamed as the Department of Education and Skills (DES) from May 2010

| | |
|---|---|
| DSM-IV | Diagnostic & Statistical Manual of Mental Disorders 4th Edition |
| DSM-V | Diagnostic & Statistical Manual of Mental Disorders 5th Edition |
| DTT | Discrete Trial Training |
| EBP | Evidence-Based Practice |
| EI | Early Intervention |
| ELC | Early Learning and Care |
| EP | Educational Psychologist |
| EPSEN | Education for Persons with Special Educational Needs Act |
| ESDM | Early Start Denver Model |
| ESCS | Early Social Communication Scales |
| fMRI | Functional Magnetic Resonance Imaging |
| GoI | Government of Ireland |
| IBR | Initiating Behavioural Requests |

| | |
|---|---|
| ICD-10 | International Classification of Disease (10th Revision) |
| ID | Intellectual Disability |
| IDG | Inter-Departmental Group |
| IJA | Initiating Joint Attention |
| IQ | Intelligence Quotient |
| JA | Joint Attention |
| JASP | Joint Attention Symbolic Play |
| JASPER | Joint Attention Symbolic Play Engagement Regulation |
| JE | Joint Engagement |
| MA | Mental Age |
| MCA | Middletown Centre for Autism |
| MSEL | Mullen Scales of Early Learning |
| NCCA | National Council for Curriculum and Assessment |
| NCSE | National Council for Special Education |
| NDBI | Naturalistic Developmental Behavioural Intervention |
| NEPS | National Educational Psychological Service |
| NICE | National Institute for Health and Care Excellence |
| NQT | Newly Qualified Teacher |
| PDD-NOS | Pervasive Developmental Disorder-Not Otherwise Specified |
| PECS | Picture Exchange System |
| RCT | Randomised Control Trial |

| | |
|---|---|
| RJA | Response to Joint Attention |
| SERC Report | Special Education Review Committee |
| SNA | Special Needs Assistant |
| SPSS | Statistical Package for the Social Sciences |
| SPA | Structured Play Assessment |
| TCRC | Trinity College Research Centre |
| TEACCH | Treatment and Education of Autistic and related Communication-handicapped CHildren |
| TEP | Trainee Educational Psychologist |
| ToM | Theory of Mind |
| UN | United Nations |
| US | United States |
| VB-MAPP | Verbal Behaviour Milestones Assessment and Placement Program |
| WoE | Weight of Evidence |
| WHO | World Health Organisation |
| ZPD | Zone of Proximal Development |

# Introduction

This section provides a brief overview of the educational provision for autistic children in Ireland. The core needs of autistic children are explored, with a specific focus on the importance of meeting these needs in Irish education. Also, outlined is the author's personal interest in the area and the way in which it inspired the present study. The rationale for the present study is then presented. Finally, the structure of the thesis is described.

## 1.1 Difference or Disorder

The fifth and most recent edition of the Diagnostic Statistical Manual (DSM-V) has defined Autism Spectrum Disorder (ASD) as a neurodevelopmental disorder, characterised by significant difficulties in the area of social interaction, social-communication, and engagement in restrictive, repetitive patterns of behaviours (American Psychiatric Association (APA), 2013). As a nation, Ireland has transitioned from a medical model of disability, concerned with viewing children in light of their deficits, to a strengths-based model in which we view the child's presenting difficulties in the context of their environment (NCCA, 2011; Ring, O' Sullivan, Ryan & Burke, 2019). This transition is aligned with Ecological Systems Theory (Bronfenbrenner, 1979).This theory acknowledges the influence of within child factors, while also highlighting the impact of environmental processes on children's learning and development. In relation to education, the Bioecological theory of child development has provided a framework to support our understanding of the contextual factors which may impact children's learning and development, such as, pedagogical practices, quality of the classroom environment, a responsive curriculum and policy context (Ring et al., 2019).

As a result of this shift in mentality, individuals diagnosed with ASD and their parents have disputed the label of disorder and described their difficulties in terms of differences. Ring, Daly, and Wall (2018) suggest we embrace the neurodiversity of individuals with ASD and reject the use of the term 'disorder' in favour of 'difference'. The author wishes to endorse this strengths-based approach, and thus the term difference will be employed when referring to ASD in this thesis. Furthermore, recent research conducted in the UK by Kenny et al. (2016) found that there was not one universally preferred term to describe autistic individuals. However, disability first language was

preferred by the majority of the autism community, their family and friends. Therefore, this research will adopt the term 'autistic' when describing autistic children.

### 1.2 Educational Provision for Autistic Children

Ireland has undergone significant reform in the way in which we educate autistic children since ASD was first recognised as a distinct category of special educational needs, requiring special educational provision (Government of Ireland (GoI), 1993). The Education Act, (1998) and the Education for Persons with Special Educational Needs (EPSEN) Act (2004) may be viewed as the key propellers towards building a more inclusive school environment (GoI, 1998; 2004). In 1998, Micheál Martin, previous Minister for Education and Science, introduced the concept of automatic entitlement to support children with special educational needs irrespective of their location or cognitive ability (Department of Education and Science (DES), 1998). With regard to ASD, special educational provision was created on the basis of a student-teacher ratio of six to one. This continues to be a model of support in the national continuum of educational provision for autistic children. Although Ireland has articulated a commitment to inclusion, there remains an on-going debate as to whether we are effectively meeting the core needs of autistic children in the school setting (Daly et al., 2016).

### 1.3 Meeting the Core Needs in the School Setting

Research has provided a robust understanding of the unique differences autistic children present within the school setting (Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010). Joint attention, joint engagement, language, and play skills have been identified as core difficulties associated with an ASD diagnosis (Chang et al., 2016). Effecting change in the aforementioned skills has been linked to improved developmental outcomes for autistic children (Wong & Kasari, 2012). However, Ware et al. (2009) reported concern in relation to the adequacy of continuing professional development (CPD) for ASD teachers and advocated for more comprehensive ASD related CPD to be provided for Irish teachers. The National Council for Special Education (NCSE) subsequently commissioned a study to investigate the role of special classes in mainstream schools and the extent to which the needs of the children attending these settings are being met. Similar to Ware et al. (2009), concerns were raised regarding teachers' skills and qualifications in relation to ASD, and their ability to meet the diverse

needs of autistic children (McCoy et al., 2014). Banks et al. (2016) found that many teachers employed in the ASD class setting had limited experience of ASD, and reported feeling under skilled and under qualified for the role. Anglim, Prendeville, and Kinsella (2018) examined the self-efficacy of six Irish primary teachers in supporting the inclusion of autistic children in the mainstream setting. Participating teachers reported apprehension and a lack of confidence in meeting the needs of autistic children in their classrooms. The need for relevant CPD, in relation to ASD in early years settings, has also been acknowledged and targeted by AsIAm, a non-profit organisation, which provides information and support to the autistic community in Ireland. AsIAm consulted with 246 early childhood teachers to identify areas in which they considered ASD related CPD was warranted (Ring, O' Sullivan, O' Keefe, Ferris, & Wall, 2019). Most relevant to the current study, participating teachers recognised the need for ASD related CPD in the areas of social skills and communication (Ring et al., 2019).

### 1.4 Rationale for Current Study

The previous section has outlined the commitment of the Irish education system to inclusion, and the emerging need for more comprehensive and impactful ASD specific CPD. Moreover, the need for effective intervention, addressing the core needs of autistic children is imperative (Wong et al., 2015), particularly at a time when the NCSE has suggested educational planning be based on an ASD prevalence rate of 1.55% (NCSE, 2015, p. 20). Research has identified joint attention difficulties as a core difficulty associated with ASD (Lawton & Kasari, 2011), outlined the significant implications such difficulties have in the school setting (Mundy & Newell, 2007), and subsequently evaluated methods for teaching these skills (Kasari, Gulsrud, Wong, Kwon & Locke, 2010; Schertz & Odom, 2007). However, a dearth of research exists in relation to the knowledge base and practices of Irish teachers in the area of joint attention. Furthermore, a recent study regarding educational psychologists' use of evidence-based ASD interventions found that the majority of participating psychologists did not use joint attention intervention in their practice. Additionally, 5.9% reported being unfamiliar with joint attention interventions (Robinson, Bond & Oldfield, 2017). This unfamiliarity with joint attention interventions reported by practicing educational psychologists may offer a potential explanation for the paucity of research in the school context. As joint attention remains central to supporting autistic children's participation, the need to provide

effective intervention to promote this core skill, in the school setting is considered essential.

### 1.5 Reflexivity Statement

The author's interest in this area was borne of both personal and professional experience. Previous to my engagement in Doctoral studies, I was a special education teacher for autistic children. Upon reflection, the most significant and ongoing challenge as a teacher was what I deemed at the time to be 'student engagement'. I attributed my students' lack of engagement to the preconceived idea of autistic children inherently attending to their own agenda. Through engagement with the taught components of the current programme, I was introduced to the construct of joint attention. My knowledge in this area was further enhanced during my first professional disability placement, working on an ASD specific team. As part of my role on this team, I conducted an array of school visits, and similar to my previous experiences, teachers consistently reported challenges in engaging autistic children. Preceding literature has outlined the importance of fostering the joint attention and joint engagement of autistic children (Mundy, 2016). Given the time children spend in the school setting, it is essential to capitalise on this time by providing intervention which targets these core skills. A role of the contemporary Educational Psychologist (EP) involves evaluating and recommending evidence-based interventions. This motivated the researcher to assume her future role as EP and identify and evaluate an intervention, which could teach joint attention skills in the ASD class setting.

### 1.6 Structure of Thesis

This thesis comprises three sections: Review Paper (Part One), Empirical Paper (Part Two), and Critical Review (Part Three). A systematic review of school-based joint attention intervention research, in addition to an overview of the theoretical basis of joint attention research, are provided in The Review Paper. The Empirical Paper provides an overview of the research carried out and comprises four main sections: Introduction, Methodology, Results, and Discussion. The Introduction will summarise the key findings of the Review Paper, state the research problem, outline the rationale for the study, and detail the research questions. A detailed account of the study's design, pre- and post-intervention measures, and ethical consideration are presented in The Methodology

section. Results of the study are outlined, and subsequently summarised and discussed in relation to the preceding literature in the Results and Discussion sections of the Empirical Paper. Finally, the Critical Review section offers a personal reflective account of the impact of the research on the researcher's professional practice.

## Part One: Review Paper

This section of the thesis reviews the relevant literature that informs the research questions for the current study. Firstly, joint attention as a construct is defined and its typical development in infancy described. Joint attention is next explored in the context of Autism Spectrum Difference (ASD), referencing the theoretical basis of its presentation. Joint attention interventions currently being utilised in the literature are presented and critiqued. A review of national and educational policy for autistic children is presented, with particular emphasis on early intervention (EI). A systematic review regarding the efficacy of school-based joint attention interventions is outlined prior to a critical review of the social-communication intervention, Attention Autism (Davies, 2013). This paper concludes with a summary and suggestions for future research.

### 2.1 Joint Attention and Joint Engagement

Joint attention is the ability of an individual to synchronise his/her attention between social stimuli (people) and non-social stimuli (objects) (Mundy, Sigman, Ungerer, & Sherman, 1986). It is a sophisticated construct which involves the development of many pertinent skills such as the ability to attend to and process the visual attention of others, monitoring and control of attention between a communicative partner and an object and/or event present in the environment, and finally the ability to process information about the object or event (Mundy, 2016). More recent research has found that joint attention skills typically consolidate during the developmental period of 9-15 months, during which time children display the ability to engage in and sustain joint attention interactions with a communicative partner. These episodes of sustained joint attention interaction between child and communicative partner are defined as joint engagement (Adamson, Bakeman, & Deckner, 2010; White et al., 2011). Preceding literature has identified supported and coordinated joint engagement as the two distinct states of joint engagement. Supported joint engagement is when an individual is actively involved with the same object or event as their communicative partner but are not overtly acknowledging the role of the communicative partner. Coordinated joint engagement is a more sophisticated engagement state and typically increases from 6-18 months. It involves the chid and communicative partner being jointly engaged with the same object

and event, and the child actively and repeatedly acknowledging their communicative partner in the interaction (Adamson et al., 2010).

### 2.2 Joint Attention and Typical Development

Joint attention, as described above, is a broad construct which describes the sharing of attention between oneself, another and an object/event. This triadic sharing begins to typically develop between the age of six and 12 months of age (Charman, 2003). This involves the use of certain behaviours such as eye gaze, pointing, following a point and showing (Charman, 2003). Joint attention as a behaviour has different forms and functions. The forms of joint attention are response to joint attention (RJA) and initiation of joint attention (IJA). While both forms of joint attention involve the coordination of attention between social and non-social stimuli, the presentations of these behaviours differ significantly. Response to joint attention is a receptive behaviour whereby the individual responds to the attentional bids of their communicative partner i.e. following a point. Initiation of joint attention is an expressive behaviour in which an individual initiates a joint attention bid towards a communicative partner. An initiation of joint attention behaviour can serve a proto-imperative or proto-declarative function. Proto-imperative exchanges involve an individual referencing their communicative partner and an object in order to request the object. The function of a proto-declarative exchange differs as it involves a triadic exchange between individual, communicative partner and object/event for the purpose of sharing (Charman, 2003).

The ability to engage in joint attention is not innate. The cognitive control of this mental ability develops over time, with its maturation beginning between two to eight months of age (Gredeback, Fikke, & Melinder, 2010), developing concurrently with social orienting and facial processing for the first six months (Mundy, 2016). Initially, newborn infants engage in dyadic exchanges, fixing their attention to people, particularly faces. However, from two to six months of age, infants develop intentional control of their visual attention. This is marked by infants' ability to shift attention more fluidly between people and objects in their environment (Mundy, 2016). Incidences of joint attention are represented by nonverbal communicative behaviours such as eye contact, gaze direction, and gesture initiation to show or request objects and/or events. The aforementioned behaviours are typically learnt between eight and 12 months of age

(Mundy, 2016). Joint attention is central to learning from and with other people, and for this reason, can be functionally differentiated from other social-communicative skills after the age of six months (Mundy, 2016). Joint attention is fundamental to infants' ability to engage in co-referencing with a communicative partner. It is expected that by the age of 13 months, a child can engage in synchronised joint engagement activities with an adult and object using visual-referencing (Bottema-Beutel, Yoder, Hochman, & Watson, 2014). It is this ability to co-reference which subsequently supports later language development (Mundy & Newell, 2007; Toth, Munson, Meltzoff, & Dawson, 2006). Table 1 below provides a visual of the order in which social-communication skills typically develop.

Table 1

*Typical Social-Communication Development (Watson et al., 2011)*

| | CATEGORIES | | |
|---|---|---|---|
| | **Social Interaction<br>Age of Emergence: 8-15 months** | **Requesting<br>Age of Emergence: 8-15 months** | **Joint Attention<br>Age of Emergence: 9-18 months** |
| **SKILL LEVELS** | During face to face games, physical activities, or routines, child watches the adult closely | Child reaches for out of reach object to show wanting the object | Child responds to another person giving objects just to share interest in the objects<br><br>Child gives objects just to share interest in objects with another person |
| | During face to face games, physical activities or routines, after a brief pause child shows wanting the game to continue (e.g., looks, moves body to make a motion of the game, touches the partner, vocalises) | Child pulls person's hand toward objects to show request for help | Child responds to another person showing objects just to share interest in the objects<br><br>Child shows objects just to share interest in the objects with another person |
| | Child plays back-and-forth games with objects or actions (e.g., exchanges objects back-and-forth) | Child gives objects to show request for help | Child follows a point to nearby objects/events just to share interest in objects/events<br><br>Child points to nearby objects/events just to share interest in objects/events with another person |
| | Child initiates familiar games or routines (i.e., not right after an adult does the action) | Child looks at nearby objects when another person points to the objects as a request (i.e. objects within reaching distance)<br><br>Child points to nearby objects to request them | Child follows a point to more distant objects/events just to share interest in the objects/events<br><br>Child points to more distant objects/events just to share interest in objects/events with another person |
| | Child expands games or routines, e.g. includes a third person in the game/routine switches roles with other person (e.g. finder vs. hider) | Child looks at distant objects when another person points to the objects as a request (i.e. objects that are beyond reach)<br>Child also points to distant objects to request them | Child follows gaze of another person to objects/events just to share interest |
| | Child combines gesture and/or vocalisation with looking at person to show wanting game to continue | Child combines gesture and/or vocalisation/verbalisation with looking at person to request | Child combines gesture and/or vocalisation/verbalisation with looking at a person just to share interest in an object/event |

## 2.3 Joint Attention and Language Development

Intentional communication is defined as a conventional or symbolic means of communication, whereby the use of verbal or nonverbal cues, i.e. gestures, eye gaze, and/or vocalisations, display the synchronised attention to both individuals and objects (Bates, 1979). Intentional communication emerges at nine months of age when, developmentally, the infant begins to understand that adults can serve as a medium to fulfil their needs (Bruinsma, Koegal, & Koegal 2004). During this time, infants also learn they have the ability to share signals which impact the behaviour of others (Bruinsma et al.2004). Initiation of joint attention has been identified as a primary facet of intentional communication (Bruinsma et al., 2004), thus highlighting the distinct contribution of joint attention to the development of communication during infancy.

Joint attention plays an important role in the social learning of language (Mundy & Jarrold, 2010). The development of joint attention skills in early infancy positively contributes to the infants' social interaction skills, and ability to learn from caregivers' scaffolding, particularly in relation to the learning of language (Bruner, 1974). It is within the context of joint attention interactions that children learn to associate words and phrases with objects and events in their environment (Toth et al., 2006). For instance, when a child can use their RJA skills to follow the direction of their parents gaze or distal point, referential mapping errors are less likely to occur (Mundy & Jarrold, 2010). Additionally, incidences of IJA support children in directing adults' attention towards an object or event of interest. It is during these natural interactions between child and caregiver that joint attention can facilitate the teaching of vocalisations and gestures (Toth et al., 2006). Consequently, impairments in joint attention can lead to missed opportunities of incidental vocabulary learning (Mody & Belliveau, 2013).

## 2.4 Autism Spectrum Difference

Autism Spectrum Difference is a lifelong neurodevelopmental condition. To receive a diagnosis of ASD, an individual must present with deficits in social interaction, social communication and engage in restricted, repetitive behaviour, as per the diagnostic criteria specified in the fifth and most recent edition of the Diagnostic Statistical Manual of Mental Disorders (DSM- V). The presence of these deficits must be evident and inhibit daily functioning (American Psychiatric Association (APA), 2013). Within the DSM-IV,

diagnostic criteria for autism or ASD was described as a triad of impairments in social interaction, social-communication, and restrictive inflexible patterns of thoughts or behaviours (APA, 1994). However, DSM-V redefined this diagnostic criteria and replaced the triad with a dyad of impairment, encompassing two key diagnostic features. Social-communication and social interaction difficulties are now conjoined and represent one element of this dyad. Restrictive, repetitive, stereotyped behaviours comprise the remaining feature of the dyad, which includes children's hyper/hypo reactivity to sensory input or an unusual interest in sensory-related aspects of the environment. This added dimension encapsulates the sensory challenges of autistic children. Previously, four subcategories of autism existed; autistic disorder, Asperger disorder, childhood disintegrative disorder and pervasive developmental disorder - not otherwise specified (PDD-NOS) (APA, 1994). However, DSM-V replaced the aforementioned categories with a singular diagnostic term Autism Spectrum Disorder (APA, 2013). Individuals who meet the DSM-V criteria are now diagnosed on a spectrum of severity, which is defined by the level of support they require to function. Individuals are identified as requiring very substantial support (Level 3), requiring substantial support (Level 2) or requiring support (Level 1) (APA, 2013). This thesis will examine joint attention across the full spectrum, with a particular focus on children whose social communication needs are best described by level two and three above.

## 2.5 Social Communication Difficulties, Joint Attention and Autism Spectrum Difference

Sigman and Capps (1997) argue that in order for a specific difficulty to be considered a core deficit[1] for a diagnostic category, the following three criteria must be met. First, the difficulty should be specific to the diagnosis and not found in other diagnoses (specificity). Second, the difficulty should be present in all children with the diagnosis (universality). Third, the difficulty should emerge during infancy (primacy). Difficulties in response to, and initiation of joint attention in children at an early age, is one of the earliest signs of ASD (Charman, 2003; Chawasrska, Klin, Paul, & Volkmar, 2007; Sullivan et al., 2007). These differences in joint attention abilities are evident in

[1] The author is committed to the adoption of a strengths-based approach and will endeavour to ensure that inclusive and positive language is used. However in certain instances, medical language will be utilised in order to be consistent with preceding psychological literature.

comparison to typically developing children and children with developmental delays (Mundy et al., 1986; Bruinsma et al., 2004; Wong & Kasari, 2012). Although joint attention difficulties are not explicitly mentioned in the diagnostic criteria for ASD in the DSM-V, preceding research has defined joint attention deficits as a core social-communication deficit and an early indicator of ASD. (Charman, 2003; Sullivan et al., 2007). This has resulted in joint attention items being incorporated into the Autism Diagnostic Interview-Revised (ADI-R) (Lord, Rutter, & Le Couteur, 1994) and the revised Autism Diagnostic Observation Schedule (ADOS-2) (Gotham, Risi, Pickles, & Lord, 2007), which are presently considered the gold standard assessment instruments for identification of ASD used by clinicians when diagnosing an ASD (Clifford & Dissanayake, 2007; Cunningham, 2012). Hence, joint attention differences have been identified as pivotal in the differential diagnosis of ASD (Murza, Schwartz, Hahs-Vaughn & Nye, 2016). A longitudinal study by Mundy, Sigman, and Kasari (1990) compared the joint attention skills of four-year-old autistic children ($n$ =15) with two control groups of developmentally delayed children matched on mental age ($n$ = 15) and language level ($n$ =15). This study found that the joint attention difficulties of autistic children observed at four years remained stable over a period of 13 months, demonstrating the test-retest reliability of joint attention difficulties for autistic children (Mundy, 2016). Consequently, joint attention has gained recognition as a core social-communication deficit associated with an ASD diagnosis due to the substantial body of empirical evidence (Lawton & Kasari, 2011; Murza et al., 2016) outlining the specificity, universality and primacy of joint attention difficulties in ASD (Sigman & Capps, 1997).

During the first two years of life, typically developing children acquire a range of nonverbal and verbal social-communication skills (Paparella & Freeman, 2015). However, the development of social-communication skills for autistic children follows an atypical trajectory (Paparella & Freeman, 2015). Requesting and commenting have been identified as the two most common functions of communication used by typically developing pre-verbal children (Bruinsma et al., 2004). Autistic children, regardless of their verbal ability, engage in dyadic communication with others. However, in comparison to their typically developing peers, the function of this communication is primarily to regulate the behaviour of their communicative partner i.e. requesting, or to regulate their environment i.e. protesting (Mody & Belliveau, 2013; Paparella &

Freeman, 2015). Therefore, the communicative exchange is not socially motivated (Paparella & Freeman, 2015). As a result, difficulties with proto-imperative behaviours may appear less pronounced than the difficulties evident in proto-declarative behaviours of autistic children (Charman, 2003). Proto-declarative joint attention behaviours, present as more severely impaired amongst autistic children, due to their underlying social function (Mundy et al., 1986; Toth et al., 2006).

As mentioned previously, joint attention is based upon the co-ordination of attention between communicative partner and object. This involves the use of nonverbal communicative actions such as eye gaze, pointing and gestural communication, all of which have been identified as presenting atypically within the ASD population (Bruinsma et al., 2004). Autistic children have been found to utilise more object-centred gestures than person-centred gestures in comparison to their typically developing counterparts (Bruinsma et al., 2004; Mundy, 2016). Typically developing children begin using pointing as a method of communication during early infancy. The act of pointing has been further subdivided into three categories: proto-imperative (requesting), proto-declarative (commenting) and referential (non-social) pointing, all of which serve different functions. As stated, autistic children are primarily motivated to communicate with others in an effort to request or to regulate their environment, proto-imperative pointing may be used in this instance (Mody & Belliveau, 2013; Paparella & Freeman, 2015). Referential pointing is a form of non-social pointing, for example pointing to an object in a book (Bruinsma et al., 2004). As a result, autistic children tend to engage in proto-imperative and referential pointing but can present with deficits in proto-declarative pointing. Proto-declarative pointing is primarily used when an individual wishes to share an experience with a communicative partner. This offers an explanation as to why autistic children use this behaviour less than their typically developing peers.

## 2.6 Implications of Joint Attention Deficits

**2.6.1 Language.** Development of language skills for autistic children tends to follow an atypical trajectory. Anderson et al. (2007) conducted a longitudinal study of 84 autistic children, from two years of age, and reported that 30% of the children had little or no consistent words at age nine. More recent research estimates that 30% of autistic children remain nonverbal across the lifespan (Tager-Flusberg & Kasari, 2013).

Acquisition of functional spoken language by the age of five is indicative of future academic, adaptive and social outcomes for autistic children (Billstedt, Gillberg, & Gillberg, 2007; Goods, Ishijima, Chang, & Kasari, 2013; Tager-Flusberg & Kasari, 2013; Toth et al., 2006). As a result, language interventions are amongst the most common intervention targets for this population, with an emphasis on increasing verbal communication (Schertz, Odom, Baggett, & Sideris, 2013). However, similar to typically developing children, joint attention is an underlying developmental factor impacting language acquisition for autistic children (Toth et al., 2006). It has been highlighted as influential to both current language abilities and future development of expressive language skills (Charman, 2003; Dawson et al., 2004; Toth et al., 2006). Joint attention abilities, particularly proto-declarative joint attention skills, have been found to influence language ability during the preschool period of three to four years (Toth et al., 2006). Responding to joint attention behaviours is also predictive of preschool children's language outcomes eight years later (Paparella & Freeman, 2015). Joint attention abilities are therefore recognised as a prognostic indicator for future language outcomes (Charman, 2003; Mundy, 2016). The targeting of joint attention skills rather than verbal communication is therefore considered more developmentally appropriate for autistic children experiencing challenges with joint attention behaviours (Schertz et al., 2013).

**2.6.2 Social Implications.** Previous theories regarding ASD aetiology described ASD as a pervasive lack of social responsiveness (Mundy, 2016). However, further research found that autistic children demonstrate similar attachment behaviours and responsiveness to parental separation and reunion as children with Down syndrome and other developmental delays (Sigman & Mundy, 1989). This has discredited this view of ASD as socially unresponsive and instead gives gravitas to the social-behavioural phenotype of ASD, signifying the necessity of ASD being viewed as a spectrum (Mundy, 2016). There is little evidence to suggest that the joint attention difficulties of autistic children impact negatively on the child-caregiver relationship (Naber et al., 2007). However, joint attention is considered central to social interaction and social learning (Mundy, 2016), and may mark the beginning of enduring difficulties in autistic children's capacity to share emotions, events, and/or interactions with others (Freeman, Gulsrud, & Kasari, 2015). Conn (2017) defines effective pedagogy as located within the quality of learning relationships, the formation of which is reliant on relatedness. The inability to

share attention with a communicative partner can inhibit an individual's prospects for relatedness and building relationships with others (Mundy & Newell, 2007). This may inhibit autistic children in effectively engaging in a learning relationship with their teachers in the school setting. In relation to peers, autistic children's difficulties with using language and gesture for the purpose of social sharing may hinder their ability to initiate and maintain interactions with peers (Chang, Shih, & Kasari, 2015). Research further suggests that autistic children who display more IJA behaviours during early childhood tend to engage in greater levels of social play during middle childhood (Chang et al., 2015). Young children form friendships with peers through engagement in games and/or activities. However, in order for a child to successfully participate in games, they rely on their IJA and RJA behaviours to comment appropriately and engage in turn-taking (Chang et al., 2015). Freeman et al. (2015) found autistic children who possessed greater joint attention skills at age three, reported their friendships as having higher levels of closeness and lower conflict, five years later. This finding suggests that early joint attention skills may be predictive of later friendship quality. Joint attention, therefore, plays a central role in social development and is considered fundamental to social competence across the lifespan (Chang et al., 2015).

## 2.7 Psychological Underpinnings

Charman (2003) states that psychological theory supports our understanding of ASD in two ways. Firstly, it defines the behaviours that are characteristic of an ASD diagnosis. Secondly, and more robustly, it offers an explanation of the underlying processes which contribute to the atypical development of autistic children. There has been much debate regarding the theoretical framework that best underpins the concept of joint attention and its development in ASD. It is beyond the scope of the current review paper to explore every theoretical perspective of joint attention development in ASD. The author will instead focus on the neurobiological theories of joint attention, the social orienting theory of joint attention, and the social-cognitive model of joint attention.

**2.7.1 Neurobiological theories.** Research in the area of joint attention development has provided a deeper insight into the complex neurological processes involved in the etiology of ASD (Mundy, Card & Fox, 2000). Mundy et al. (2000) suggest that two interacting attention-regulation systems are involved in joint attention

development. Firstly the posterior-parietal attention system begins to develop during early infancy and is responsible for the prioritization of orientation towards 'biologically meaningful stimuli' (Mundy & Newell, 2007, p.3), which may support the development of RJA skills. Secondly, the frontal-anterior attention system has been linked to IJA development, due to its role in controlling one's capacity to share attention voluntarily across dual tasks (Mundy et al., 2000). Studies using functional magnetic resonance imaging (fMRI) have found anomalies in the left frontal and parietal lobes of autistic children's brains. This offers a biological explanation for autistic children's difficulties in relation to IJA and RJA during early childhood.

Research has discovered that neurodevelopment is not solely biologically and genetically predetermined, the environment can also have an influence (Mundy, 2016). This led to a theoretical postulation that early infant experiences determine a significant amount of postnatal neural development. The research in this area outlines an experience-expectant model of neurodevelopment (Mundy & Neal, 2000), which proposes that the brain exhibits a readiness to receive specific forms of environmental information. When the brain exhibits this readiness, it initially results in an overproduction of synaptic connections within the brain. This typically occurs in the first 12-24 months of infancy, and gradually decreases through the process of synaptic pruning (Mundy & Neal, 2000). Early childhood experiences and environmental stimulation are influential to this synaptic pruning process. Therefore, if there is a lack of early environmental input, less synaptic pruning may occur, subsequently leading to an abnormal neural structure (Charman, 2003; Mundy & Neal, 2000). Research has suggested that a number of early experience-expectant effects may consist of self-organisation processes, whereby some forms of expected experiences may be reliant on the developing infant to produce them (Mundy & Neal, 2000). For example, pre-verbal social-communication interactions require the active participation of the child in acquiring and organising experience, which subsequently delivers crucial experience-expectant information during infancy. Research has identified the tendency to regularly engage in social orienting, and in time joint attention, during infancy as a crucial element of the infants' self-organising behaviour during experience-expectant processes (Mundy & Neal, 2000). A reduced occurrence in social orienting and the associated self-organising behaviour in autistic children may lead

to a reduction of social information input to the developing neurological system, and ultimately impact joint attention abilities (Mundy & Neal, 2000).

**2.7.2 Social orienting theory.** Biologically, the orbitofrontal-striatum-amygdala in the brain has been consistently found to present abnormally in autistic individuals, particularly in response to social stimuli (Bachevalier & Loveland, 2006). Preceding research suggests that autistic children do not show a preference for orienting to social sounds in comparison to non-social sounds (Dawson, Meltzoff, Osterling, Rinaidi, & Brown, 1998; Klin, 1991), unlike their typically developing peers. Dawson et al. (1998) subsequently defined this as social orienting deficit and proposed that it may be influential in the developmental trajectory of ASD. Difficulties with face processing were subsequently highlighted as a variation of this social orienting deficit (Dawson, Webb, & McPartland, 2005). Difficulties in social orienting towards visual and auditory information, of a social nature, may explain the associated joint attention difficulties experienced by autistic children (Mundy, 2016). These social orienting difficulties may produce a negative feedback system, in which the failure to orient to social cues compromises the elicitation of social responses from others. Thus, further hindering the social development of cognitive processes such as joint attention and later theory of mind (ToM) (Schertz & Odom, 2004). However, the appropriateness of the social orienting model of joint attention has been contested due to empirical evidence suggesting that joint attention manifests earlier than first predicted. A study by Farroni, Csibra, Simion and Johnson (2002) found that joint attention behaviours are evident in the first days of infancy, therefore contradicting the belief that social orienting development is a foundational precursor to joint attention.

**2.7.3 Social-cognitive model of joint attention.** Social cognition is defined as a wide-ranging set of abilities that allow individuals to comprehend their own attitudes and beliefs about social situations, to ascribe similar attitudes to others, and to use this information to predict behaviour (Garfield, Peterson, & Perry, 2001). Difficulties in relation to social-cognition are associated with a diagnosis of ASD (Mundy & Newell, 2007). Social orienting and face processing skills are considered dyadic forms of social engagement and social learning (Mundy, 2016). In contrast, joint attention is pivotal for triadic social engagement and social learning. Joint attention makes a distinct contribution to human cognition, enabling individuals to share experience and information about a

common referent that goes beyond the partners themselves. It is this characteristic of joint attention that constitutes its role in social-cognitive development (Mundy, 2016). The social-cognitive model suggests that as young children monitor and understand their own goal-related intentional behaviour, they also monitor the goal-related intentional behaviour of others. It is through this understanding that children recognise the influence of their own intentions on their behaviour, and similarly how others behaviours are dictated by their intentions also (Mundy & Newell, 2007). This marks the emergence of subjectivity and the child's attribution of subjectivity of others (Mundy, 2016). The social-cognitive model concludes that children can only engage in joint attention behaviours if they truly comprehend the intentional or goal-directed nature of others' attention (Mundy, 2016). Therefore, indicating that social cognition is integral to the development of functional joint attention skills. Following attainment of functional joint attention skills during infancy, a transition from overt joint attention behaviours to the development of mental joint attention processes begins (Mundy, 2016). Theory of Mind is one of the most influential explanatory cognitive models of ASD (Baron-Cohen, Leslie, & Frith, 1985). It is a more sophisticated social-cognitive function which allows a person to understand that everyone possesses an independent internal mental state (Baron-Cohen et al., 1985). It is within the context of joint attention interactions that ToM skills develop. The social-cognitive model hypothesises that the social-cognitive difficulties present in ASD are responsible for the joint attention deficits of young autistic children (Mundy, 2016). This model further postulates that these deficits in joint attention, subsequently contribute to ToM difficulties in older children (Mundy, 2016).

### 2.8 Early Intervention for Autistic Children

The idea of autism recovery was first introduced by Lovaas (1987). He observed that 47% of children within his study ($n$ = 19) recovered from ASD as a result of early intensive behavioural intervention. Recovery, in this instance, was defined as cognitive functioning in the average range, and the ability to cope in a mainstream setting. However, this definition of recovery has since been criticised, as children can simultaneously possess an average IQ and present with ASD symptomology, which may be indicative instead of high functioning ASD (Mundy, 1993). Although similar results have been reported by independent researchers (Sigman et al., 1999), there is an argument within the field that this loss of diagnosis may be better explained by initial misdiagnosis (Fein

et al., 2013). Although this area remains controversial, within the literature, it is universally accepted that intensive early intervention (EI) promotes better outcomes for autistic children (Sallows & Graupner, 2005; Sutera et al., 2013). Contemporary literature regarding neuroplasticity i.e. the ability of the brain to restructure as a result of experience, has also endorsed the importance of EI for autistic children (Bradshaw, Steiner, Gengoux, & Koegel, 2015). However, accessing EI has not been the only factor found to contribute to positive outcomes. Prognosis can also depend on the type of intervention received, the duration of intervention and adherence to fidelity (Landa, 2018). Perhaps more relevant to the current research, is the finding that child characteristics such as initial language and joint attention skills also influence prognosis (Bono, Daley & Sigman, 2004). Targeting joint attention skills of autistic children during EI is therefore critical due to its strong association with better developmental outcomes (Wong & Kasari, 2012).

**2.8.1 Early Intervention Approaches for Autistic Children.** The importance of nurturing positive social engagement to promote the social learning abilities of autistic children is at the forefront of EI theory (Mundy, 2016). Historically, behavioural interventions were viewed as the most appropriate and effective form of EI for autistic children (Peters-Scheffer, Didden, Korzilius, & Sturmey, 2011). This was based on the presupposition that autistic children find it difficult to learn skills through interaction with their natural environment, and therefore require modification of their environment to include simplistic instructions and compelling reinforcers (Lovaas, 1987). Behavioural methodologies such as Discrete Trial Training (DTT), have been, and continue to be used extensively with ASD populations to successfully teach target skills (Smith, 2001). However, the use of such methodologies has been criticised due to children developing an over-reliance on prompts, and displaying an inability to generalise skills (Schreibman et al., 2015). In addition to this, behavioural approaches require substantial resources with best outcomes reliant on 30-50 hours of one-to-one support weekly for at least a year (Mundy, 2016). Furthermore, autistic children often have difficulty in their abilities to spontaneously initiate behaviours and engage in self-organised learning (Mundy, 2016). As Applied Behaviour Analysis (ABA) is a methodology, which focuses on teaching children to respond to adult directives, it may not support the improvement of children's spontaneous initiation of learning opportunities with others (Mundy, 2016). In contrast to

behaviourist theory, developmental theorists proposed that children learn best when they are actively engaged within their naturalistic learning environment (Vygotsyky, 1962). Developmental interventions are therefore child-directed and take place in naturalistic settings (Bradshaw et al., 2015). Child preferences and interests are used as a pivot to promote engagement, social interaction and learning (Mundy, 2016). A particular strength of developmental approaches is the application of the principles to the children's naturalistic environment. This provides children with skills to learn in the context of their typical daily routine and fosters generalisation of skills learnt (Schreibman et al., 2015). McMahon and Cullinan (2016) highlight that educators in Europe tend to use an eclectic approach when teaching autistic children, which is defined as methods combining multiple principles and strategies from a variety of theories. For instance, the reported efficacy and strengths of both ABA and developmental approaches allowed the amalgamation of components from both methods to form the creation of naturalistic developmental behavioural interventions (NDBI). This type of intervention has been found to be especially effective when used as a means of EI for autistic children (Schreibman et al., 2015). The following section will outline the empirical evidence supporting the use of both ABA and NBDI to promote joint attention.

**2.8.1.1 Behavioural approaches.** As stated previously, the use of intensive behavioural interventions can promote positive outcomes for autistic children, through teaching skills using reinforcement to motivate the occurrence of desirable behaviours. Principles of ABA have been utilised in research to teach autistic children both RJA and IJA joint attention behaviours (Meindl & Cannella-Malone, 2011). Whalen and Schriebman (2003) found teaching four-year-old autistic children RJA and IJA behaviours, through the use of DTT and pivotal response training, to be effective. All children effectively learnt RJA behaviours and four out of five children made gains in IJA behaviours. These skills were also generalised across contexts, such as with parents. Rocha, Schriebman and Stahmer (2007) trained parents to use ABA techniques to teach RJA behaviours to their children. Although all three children displayed improvements in their RJA, some skills taught in the laboratory setting were not transferred to the home context. During follow-up, parents had not continued to use the approaches taught in the laboratory at home. Overall, behavioural based joint attention interventions have been found to be more successful in relation to RJA than spontaneous IJA (Mundy, 2016).

**2.8.1.2 Naturalistic developmental behavioural approaches.** The Early Start Denver Model (ESDM) (Rogers & Dawson, 2010) is a naturalistic EI approach which combines adult-directed behavioural methods with child-directed incidental learning opportunities. Significant increases in autistic children's social-communication behaviours have been reported following the use of the ESDM (Dawson et al., 2010). This is considered a comprehensive intervention, whereby multiple developmental areas are targeted (Schreibman et al., 2015). Kasari, Freeman, and Paparella (2006) created a more focused intervention to specifically target joint attention and symbolic play for autistic children. This intervention taught the aforementioned skills through daily intervention sessions over a period of six weeks. Each intervention session involved five minutes of table-top activities, during which time behavioural approaches were used to shape joint attention and play skills. This was followed by twenty minutes of child-led naturalistic floor-based milieu teaching to encourage generalisation of skills. This study reported promising findings of this intervention in promoting joint attention. This approach was subsequently extended and is now known as Joint Attention Symbolic Play Engagement Regulation (JASPER) (Kasari et al., 2006; Kasari, Paparella, Freeman, & Jahromi, 2008). It is a manualised approach and is considered evidence-based (NICE, 2013), due to its success in teaching joint attention and symbolic play to autistic children (Kasari et al., 2006; Kasari et al., 2014; Kasari, Gulsrud, Paparella, Hellemann, & Berry, 2015).

## 2.9 Implication of Joint Attention Difficulties in the School Setting

The previous section outlined the empirical evidence which exists for improving joint attention using behavioural and NDBI interventions. However, the majority of this research has been conducted in the laboratory setting, in which the interventionists were therapists or experienced researchers (Kasari et al., 2006; Kasari et al., 2008; Whalen & Scriebman, 2003). More recently, parent mediated studies have also been conducted (Kasari, Gulsrud, Wong, Kwon & Locke, 2010; Schertz & Odom, 2007; Scertz, Odom, Baggett & Sideris, 2013; Shire et al., 2014). However, given the time children spend in the school setting, a significant paucity of research regarding this context exists. The development of RJA has been identified as integral to children's capacity for learning from instruction during the preschool period (Mundy, 2016). Furthermore, the ability to engage in joint attention interactions supports children in benefiting from both intentional

and incidental teaching (Mundy, 2016). Finally, autistic children may be less likely to attend to instruction, participate and engage in class than their typically developing counterparts, due to their joint attention difficulties. This lack of joint engagement can have a negative influence on classroom-based active engagement (Sparapani, Morgan, Reinhardt, Schatschneider, & Wetherby, 2016), which further highlights the negative implications of joint attention difficulties in the school setting.

### 2.10 National Policy

The previous section emphasised the implications of joint attention difficulties in the school setting. The following section will consider national policy in relation to educational provision for autistic children in Ireland both historically and currently.

Educational policy and practice has undergone significant reform in Ireland, transitioning from a medical model to a biopsychosocial model of disability, in which the child is viewed in the context of their environment and interacting systems (Bronfenbrenner 1979; Griffin & Shevlin, 2011). Although many special educational needs policies have been influential, the author will focus on those most significant to the educational provision of autistic children. Figure 1 provides a visual timeline of the main developments in educational provision for autistic children between 1992 and 2016.

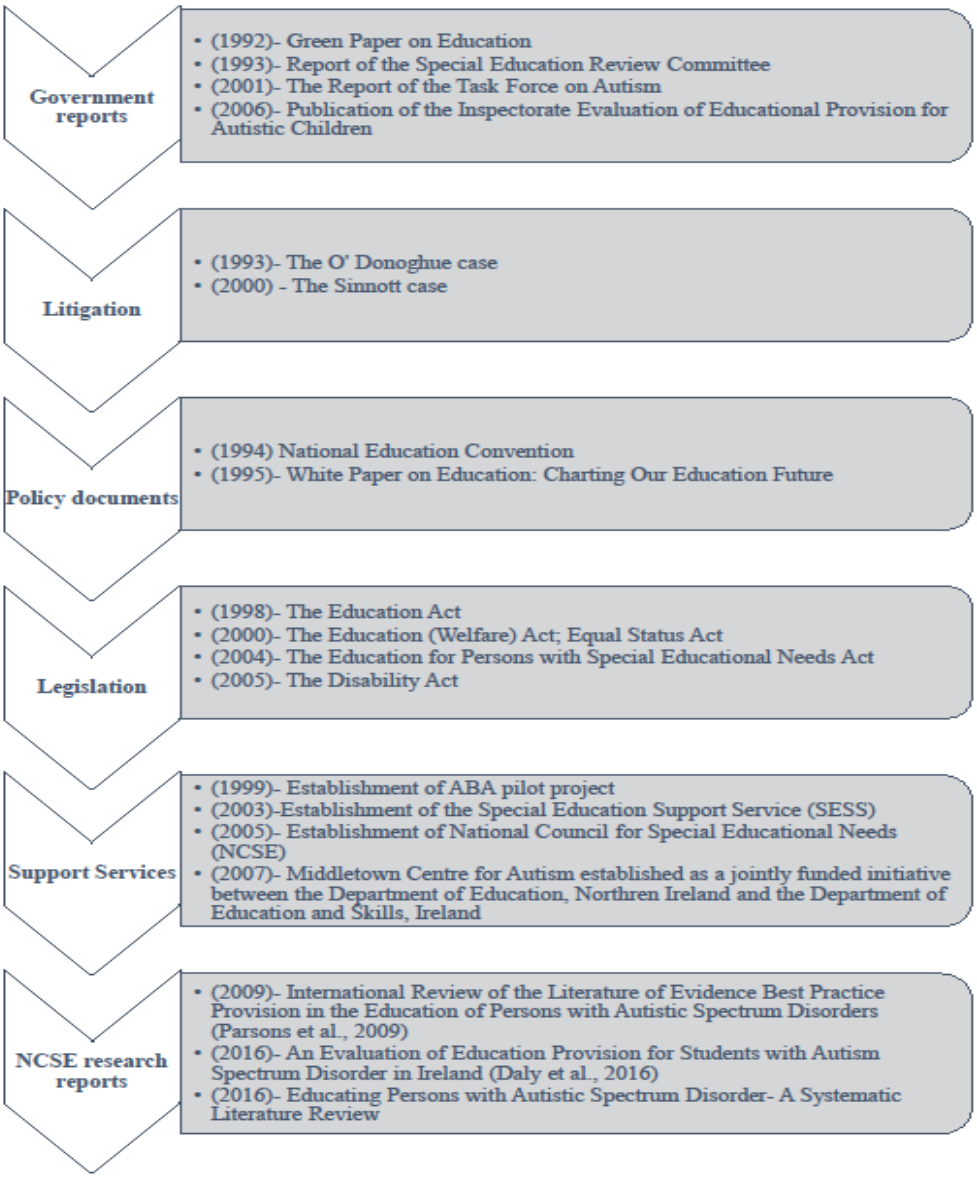



*Figure 1.* Timeline of Developments in Educational Provision for Autistic Children. (Adapted from Griffin and Shevlin, 2011).

The Department of Education and Science (DES) established the Special Education Review Committee (SERC) in 1991 to investigate the existing special education provision and offer recommendations for the future. In 1992, the Green Paper on Education identified the issuing of policy directives through circulars as inadequate, and expressed the need for education legislation in Ireland. Subsequently, the SERC Committee published the SERC Report (Government of Ireland (GoI), 1993). This report

provided seven guiding principles to inform an education system, where all children could belong. These principles are outlined in Figure 2. This report also advocated for EI and preschool education to be made available to all children, particularly autistic children (GoI, 1993).


*Figure 2.* Seven Principles of the Special Education Review Committee (SERC) Report (GoI, 1993).

At the time of the SERC report, Ireland remained without a legislative basis for education and ASD was viewed within the context of other comorbid disabilities such as general learning disability, emotional and/or behavioural disturbances. The SERC report and the White Paper (GoI, 1993, 1995) further articulated the need for education legislation. Also influential in the emergence of education legislation was the judicial proceedings which took place at this time advocating for the constitutional rights of children with special education needs to an appropriate education (Griffin & Shevlin, 2011). In 1998 the Education Act, (GoI, 1998) created a statutory basis for providing all children with a right to access and participate in an appropriate education according to their individual ability and potential. In November 1998, the Minister for Education and Science, Micheál Martin introduced automatic entitlement as a means of supporting children with special educational needs irrespective of their geographical location or learning ability (DES, 1998). Thereafter, the DES recognised ASD as a distinct disability

requiring special educational provision. Thus, entitling autistic children to additional support teaching and access to special educational needs assistants (SNAs). Following ASD being classified as a distinct disability in education, a continuum of educational placements became available for autistic children in mainstream schools, special schools and special classes within mainstream schools. Special classes were created to provide autistic children with special separate educational provision on the basis of a child-teacher ratio of six to one and with the support of special needs assistants, in addition to part-time inclusion in mainstream classes, where appropriate (DES, 1998). There are currently 1,219 ASD classes located in mainstream primary schools (NCSE, 2019a). In addition to 130 EI ASD special classes for children aged three to five, located in Irish primary schools (NCSE, 2019a). The ratio within these classes remains six children to one teacher and two SNAs. Inclusive education in Ireland is viewed as an educational continuum encompassing mainstream classes, special classes in mainstream schools and special schools, in which all children are included in education and their needs met, regardless of their disability (NCSE, 2019c). However, it has been argued that the existence of parallel educational settings within a school environment, i.e. mainstream educational system and separate special education system, contradicts the definition of an inclusive educational environment (NCSE, 2019c). The author conceptualises inclusion not solely as the physical environment children are educated in but subscribes to a needs-based inclusion model, whereby the naming of children's differences and the use of specialist methodologies is an indicator of an inclusive educational environment (Ravet, 2011).

In an effort to review the educational provision and support services accessible to autistic children and assess their adequacy, the Minister of Education and Science, Dr. Michael Woods commissioned a Task Force in October 2000. The Report of the Task Force on Autism was published in 2001, which concluded that the provision and resources at this time were insufficient to cater for autistic children in Ireland. This report issued many recommendations, one of which further advocated for the importance of early identification and accompanying EI (DES, 2001). A commitment to inclusion is evident in further legislation, evidenced initially by the EPSEN Act in 2004 (GoI, 2004). The primary objective of this Act was to provide children with special educational needs with the same right to avail and benefit from appropriate education as their peers without special educational needs. The Act further stipulated that this education should take place,

wherever possible, in an inclusive educational environment, i.e. a mainstream classroom, with those who do not have special educational needs (GoI, 2004). Although it is 16 years since the EPSEN Act was introduced, many of the provisions of the Act, to assist the inclusion of autistic children, have not been implemented. However Ireland is committed to the education of children in the mainstream setting wherever possible. For instance, in the academic year 2015-2016, there were reportedly 16,094 autistic children attending school, across all educational settings (GoI, 2018). The majority (9,828) of autistic children were being educated in a mainstream setting. Additionally, the impetus of the Access and Inclusion Model (AIM) (Inter-Departmental Group (IDG), 2015) is to provide early inclusive preschool education and endeavours to support all children with special educational needs within mainstream early learning and care (ELC) settings.

The NCSE was formally established as an independent statutory body in October 2005 under the EPSEN Act. The functions of the NCSE are outlined in Section 20 of the EPSEN Act (GoI, 2004) and summarised in Figure 3 below. The NCSE continues to conduct extensive research relating to the educational provision of autistic children (Daly et al., 2016) and document educational interventions which demonstrate evidence of effectiveness for autistic children (Bond, Symes, Hebron, Humphrey, & Morewood, 2016; Parsons et al., 2009). Recent literature reviews, evaluating best practice for autistic children, identified joint attention interventions as interventions possessing the most evidence of efficacy for preschool autistic children (Bond et al., 2016; Parsons et al., 2009).

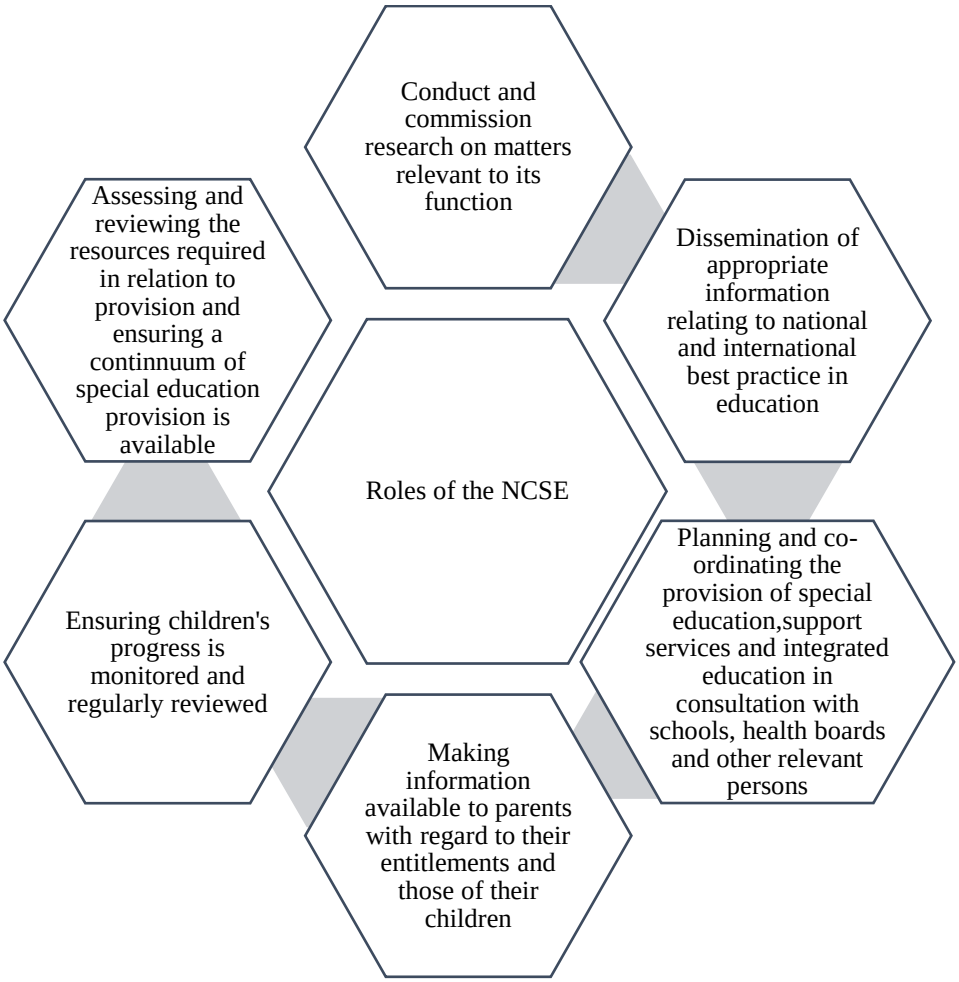



*Figure 3*. Role of the NCSE (GoI, 2004)

### 2.11 Joint Attention Interventions in the School Setting

The National Institute for Health and Care Excellence (NICE) published quality standard guidelines to support the quality of care provided to autistic children and adults (NICE, 2013). These guidelines explicitly recommend the inclusion of psychosocial interventions for autistic children, such as a specific social-communication intervention which targets the core deficits associated with a diagnosis of ASD. It further recommends that social-communication interventions should incorporate play-based approaches with parents and teachers, targeting joint attention, engagement and reciprocal communication of autistic children (NICE, 2013). Conversely, the existing literature suggests that the average preschool curricula and practices do not overtly target social-communication skills (Hess, Morrier, Heffin, & Ivey, 2008; Keen Sigafoos, & Woodyatt, 2005). Within

the Irish context, evidence-based ASD specific strategies such as ABA, Picture Exchange Communication System (PECS) (Bondy & Frost, 1994), and Treatment and Education of Autistic and related Communication Handicapped CHildren (TEACCH) (Mesibov, Shea & Schopler, 2005) are being implemented in the ASD class setting (Daly et al., 2016). However, there is little evidence to suggest that joint attention skills are included in curriculum planning (Wong & Kasari, 2012).

## 2.12 Systematic Review

**2.12.1 Aim of review.** The existing literature clearly delineates the negative implications of poor joint attention skills on the developmental outcomes of autistic children across a number of contexts. However, engagement with the preceding literature in this area has highlighted the limited school-based joint attention research available. Given the length of time children spend in school across the lifespan, and the impact poor joint attention has on academic outcomes, classroom engagement and participation (Sparapani et al., 2016), it appears pertinent to explore the evidence-base in relation to school-based intervention in the area. As a result, the aim of this systematic review is to provide a critical appraisal of existing school-based joint attention interventions.

**2.12.2 Review question.** How effective are school-based interventions in teaching joint attention skills to autistic children?

**2.12.3 Literature search.** A comprehensive literature search was carried out to attend to the review question presented. Initially, in July 2019, the type of documents to be included and the search terms necessary to find these documents were determined. It was decided that included documents would be peer-reviewed journal articles or research reports published in the English language. Books and book reviews were excluded from the literature search. The search terms decided upon were categorised as follows:

- Terms relating to ASD and/or autism
- Terms relating to school-based interventions
- Terms relating to social-communication

The initial search was conducted using the online databases PsychInfo® (American Psychological Association (APA), 2020); PsychArticles® (APA, 2020); ERIC (Institute of Education Sciences, 2020), and Academic Search Complete (EBSCO, 2020). The

search terms used for all databases is presented in Table 2. This initial search yielded a total of 251 articles. Articles were then filtered using the inclusionary and exclusionary criteria found in Table 3 below.

Table 2

*Search Terms and Results*

| **Search Terms** | **Academic Search Complete** | **ERIC** | **PsychInfo ®** | **PsychArticles ®** |
|---|---|---|---|---|
| Autis* OR ASD<br><br>School-based or classroom-based interventions or teacher implemented<br><br>Social communication OR joint attention OR joint engagement | 44 | 28 | 167 | 12 |

Table 3

*Inclusion/Exclusion criteria*

| **Study Feature** | **Inclusion criteria** | **Exclusion criteria** | **Rationale** |
|---|---|---|---|
| 1. Type of publication | The study was a peer reviewed journal and a full text | The study is not peer reviewed and the full text is not available online | Research published in a peer reviewed article has been evaluated by expert reviewers and has met quality standards |
| 2.Participants | Children must be between 2-7 years and have a clinical diagnosis of ASD | Participants do not have a clinical diagnosis of ASD | This review aims to evaluate joint attention interventions for autistic children |

| | | | |
|---|---|---|---|
| 3. Setting | Intervention must take place in the classroom/ school setting | Intervention being delivered outside the school setting | This review is evaluating the efficacy of school-based joint attention interventions |
| 4. Language | The study must be written in the English language | All or part of the study is not available in English | This is to ensure the study can be interpreted as there is no translator available. |
| 5.Intervention | The study clearly utilises an intervention that targets joint attention skills. | The study uses interventions to target other areas of social-communication but does not explicitly target joint attention | The aim of the review is to investigate the efficacy of interventions to improve joint attention |
| 6. Measures | The study must utilise pre- and post-intervention data | The study does not contain pre- or post-intervention data | This helps to identify the effectiveness of an intervention |
| 7. Outcome variables | Joint attention must be reported as a primary outcome variable | Joint attention reported as a secondary outcomes | Review aims to investigate the efficacy of JA interventions |

The filter full text and peer reviewed were applied to the search. The 251 articles previously found were reduced to 99. Duplicates were then removed which gave a total of 60 articles to be screened. Titles were screened for relevance to the review question and a further 44 articles were removed. The remaining 16 articles were screened by their abstracts, this resulted in a further removal of 6 studies. Studies removed at this stage are provided with a rationale for exclusion in Table 18 (Appendix A). The remaining 10 articles were screened by applying the inclusion criteria to the full text, this resulted in a further removal of six studies. Studies removed at this stage are also provided with a rationale for exclusion in Table 18 (Appendix A). The six studies chosen for inclusion in this systematic review can be found in Table 4 below. Figure 4 displayed below is a visual to support the screening process.

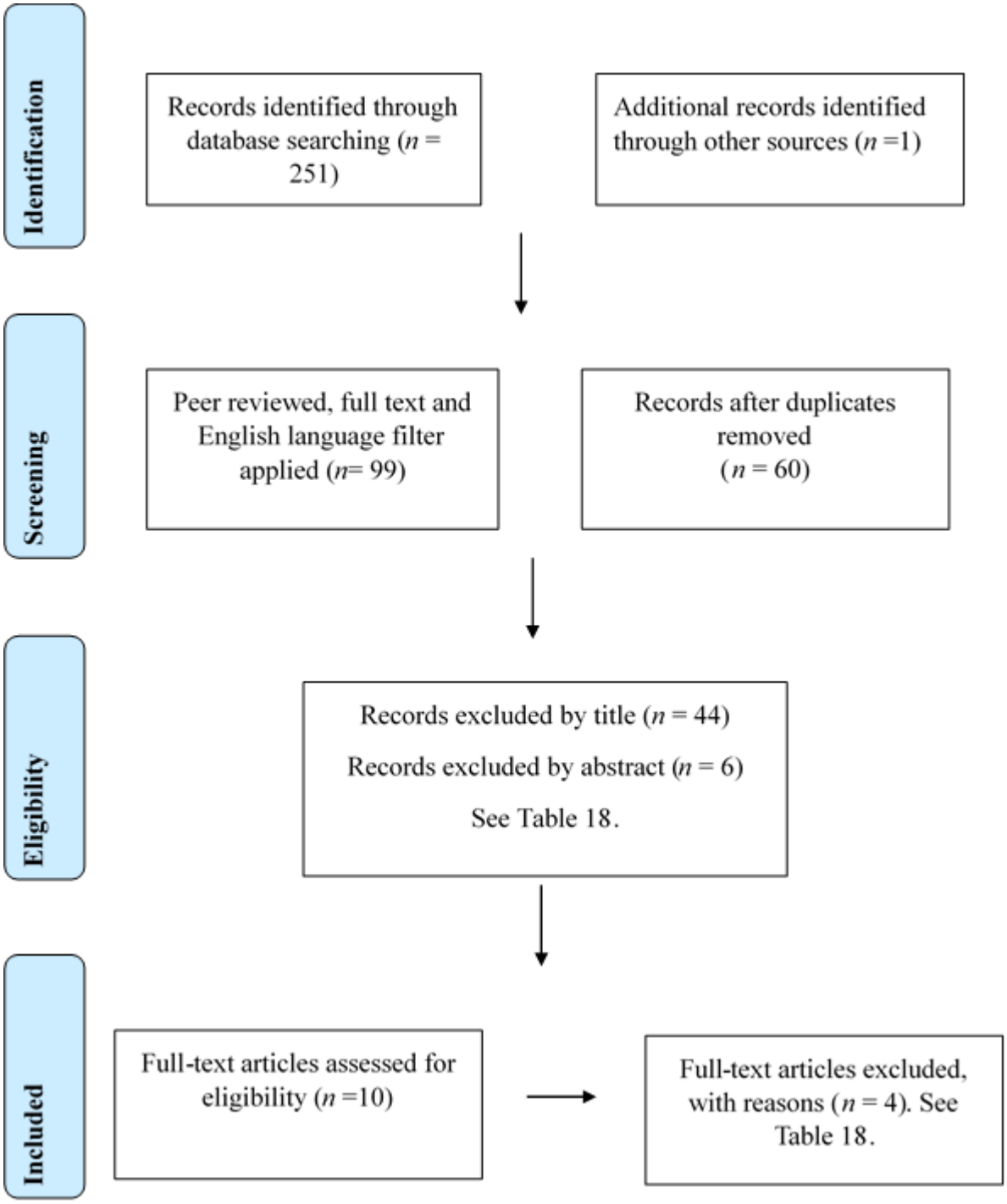



*Figure 4.* Screening Process

Table 4

*References of Included Studies*

Boyd, B. A., Watson, L. R., Reszka, S. S., Sideris, J., Alessandri, M., Baranek, G. T., ... & Belardi, K. (2018). Efficacy of the ASAP intervention for preschoolers with ASD: A cluster randomized controlled trial. *Journal of Autism and Developmental Disorders*, *48*(9), 3144-3162.

Chang, Y. C., Shire, S. Y., Shih, W., Gelfand, C., & Kasari, C. (2016). Preschool deployment of evidence-based social communication intervention: JASPER in the classroom. *Journal of Autism and Developmental Disorders*, *46*(6), 2211-2223.

Goods, K. S., Ishijima, E., Chang, Y. C., & Kasari, C. (2013). Preschool based JASPER intervention in minimally verbal children with autism: Pilot RCT. *Journal of Autism and Developmental Disorders*, *43*(5), 1050-1056.

Kaale, A., Smith, L., & Sponheim, E. (2012). A randomized controlled trial of preschool-based joint attention intervention for children with autism. *Journal of Child Psychology and Psychiatry*, *53*(1), 97-105.

Lawton, K., & Kasari, C. (2012). Teacher-implemented joint attention intervention: Pilot randomized controlled study for preschoolers with autism. *Journal of Consulting and Clinical Psychology*, *80*(4), 687-693.

Wong, C. S. (2013). A play and joint attention intervention for teachers of young children with autism: A randomized controlled pilot study. *Autism*, *17*(3), 340-357.

**2.11.4 Weight of evidence.** In order to systematically review the included studies, the Weight of Evidence (WoE) framework by Gough (2007) was applied. The studies were assessed based on their methodological quality (WoE A), their methodological relevance to the review question (WoE B), and their topic relevance to the review question

(WoE C). WoE D represents the overall WoE score attained by each study. WoE D was determined by averaging the scores each study attained across WoE A, B and C. WoE D scores in the range of 2.6 to 3 are awarded a high weighting, those in the range 1.5 to 2.5 are awarded a medium rating and those 1.4 or below are awarded a low weighting. Table 5 summarises the WoE and numerical ratings received by each study. 'Quality Indicators for Group Experimental and Quasi-experimental Research in Special Education' (Gersten et al., 2005) was used to evaluate the methodological quality (WoE A) of the studies. A more detailed explanation of the WoE criteria and ratings are presented in Appendix B.

Table 5

*Summary of WoE Judgements*

| **Study** | **WoE A** | **WoE B** | **WoE C** | **WoE D** |
|---|---|---|---|---|
| Boyd et al. (2018) | High (2.66) | Medium (2) | Medium (2) | Medium (2.22) |
| Chang et al. (2016) | Medium (2.3) | High (3) | High (3) | High (2.76) |
| Goods et al. (2013) | Medium (2) | Medium (2) | Low (1) | Medium (2) |
| Kaale et al. (2012) | High (3) | Medium (2) | High (2) | High (2.67) |
| Lawton & Kasari (2012) | High (2.66) | Medium (2) | High (3) | Medium (2.55) |
| Wong (2013) | High (3) | High (3) | Medium (2) | High (2.67) |

## 2.13 Review of School-based Joint Attention Research

**2.13.1 Participants.** A total of 353 participants are included in this review of research examining the impact of school-based joint attention interventions on the joint attention of autistic children. Sample sizes within the studies ranged from 15 (Goods et al., 2013) to 161 (Boyd et al., 2018). All studies utilised a preschool sample, ranging in age from two to five years old. Four studies reported ethnically diverse samples (Boyd et al., 2018; Chang et al., 2016; Goods et al., 2013; Wong, 2013), which may support the generalisability of the results, multi-culturally. All studies noted gender disparity within the studies' samples, representative of the higher prevalence of ASD amongst males (Werling & Geschwind, 2013). All studies aimed to evaluate the effectiveness of school-based social-communication interventions on the joint attention and joint engagement of

autistic children. However, inclusion criteria pertaining to ASD diagnostics differed amongst studies. Five out of the six studies clearly outlined rigid inclusion criteria being that children must possess a clinical diagnosis of ASD, as outlined by the tenth edition of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) (World Health Organisation, 2004) (Chang et al., 2016; Goods et al., 2013; Kaale et al., 2012; Lawton & Kasari, 2012; Wong, 2013). However, the remaining study conducted by Boyd et al. (2018) made references to researcher administration of the ADOS-2 (Gotham et al., 2007), which contributed to their lower rating in WoE A. All studies provided detailed summaries of child characteristics such as mental age and language level of participating children at study entry, which were reported as being significantly below the participants' chronological ages.

**2.13.2 Setting.** The majority of studies included in this review were conducted in the United States (US) (Boyd et al., 2018; Chang et al., 2016; Goods et al., 2013; Lawton & Kasari, 2012; Wong, 2013), with the exception of the study conducted by Kaale et al. (2012), which was operationalised in Norway. All studies took place in the school setting which led to greater methodological relevance (WoE B) ratings. However, while all schools were preschools catering for the same age group, there were differences in the type of preschool, services offered, and staff employed. Table 6 provides a summary of the diversity in school settings in relation to educational teams, type of settings, curriculum used, access to external support, and adult-child ratios. All studies compared child and teacher characteristics across groups and reported little to no significant differences between intervention and control groups within their studies. In addition to this, Boyd et al. (2018) asked participating intervention and control teachers to complete the Classroom Practice Inventory (CPI) (Reszka et al., 2014) as a means of identifying any significant differences in classroom instructional practices. The remaining studies referenced the teaching methodologies used by teachers but did not disclose if significant differences in practices existed across classrooms.

Table 6

*Summary of School Settings*

| **Study** | **Setting** | **Staff (educational team, adult: child ratio)** | **Curriculum** |
|---|---|---|---|
| Boyd et al. (2018) | Public preschools (*n*=78) | Teacher, paraprofessional, and occupational therapist/speech and language therapist | Eclectic approach using ASD specific methodologies such as TEACCH, social skills training, and PECS |
| Chang et al. (2016) | ASD specific preschools (*n* = 6) | Special education teacher, teaching assistant, SLT, and behaviour consultant 1:2 | ABA-based curriculum |
| Goods et al. (2013) | Non-public ASD specific preschool (*n* = 1) | Information regarding this not provided by study | 30 hours per week of ABA |
| Kaale et al. (2012) | ASD class in mainstream preschool (*n* =4)<br>Mainstream preschool (*n* = 54)<br>ASD specific preschool (*n* =3) | Teacher and paraprofessionals 1:1 support | Systematic training in areas such as communication and social skills based on either ABA or an eclectic approach |
| Lawton & Kasari (2012) | Public preschool Inclusive setting (n=8)<br>ASD specific class (*n* = 3 | Teacher and paraprofessional 9.58:1 Receiving weekly SLT | Information regarding this not provided by study |
| Wong (2013) | Public and private preschools<br>ASD specific preschool class (*n* =4)<br>Non-categorical (*n* = 5) | Class teacher and one to three paraprofessionals | Information regarding this not provided by study |

**2.13.3 Design.** All six studies, undergoing appraisal, used a randomised control trial (RCT) experimental design with either an active (Boyd et al., 2018; Goods et al., 2013; Kaale, et al., 2012) or waitlist control (Chang et al., 2016; Lawton & Kasari, 2012; Wong, 2013). Randomised control trials are considered the gold standard of experimental designs when testing the efficacy of an intervention, therefore this contributed to higher

ratings in terms of methodological quality (WoE A). All studies controlled for selection bias by implementing randomisation. Each study ensured individuals included in the study were suitable candidates prior to randomisation. The process of randomisation was also clearly defined in all of the included studies.

**2.13.4 Measures.** Multiple measures were utilised across studies to measure joint attention, joint engagement, and play skills. Prior to the intervention, studies used a range of measures to determine the suitability of participating children and to gain an insight into their developmental abilities at baseline. In order to determine the developmental level of the children, many studies administered the Mullen Scales of Early Learning (MSEL) (Mullen, 1997) to calculate a developmental quotient (Chang et al., 2016; Goods et al., 2013; Kaale et al., 2012). Verbal comprehension and expressive language abilities were measured (Goods et al., 2013; Kaale et al., 2012) using the Reynall Developmental Language Scale (Hagtvet, Lillestoen & Reynall, 1985). The majority of studies assessed the social-communication of participating children with the Early Social Communication Scales (ESCS) (Mundy et al., 2003) at both baseline and post-intervention (Chang et al., 2016; Goods et al., 2013; Kaale et al., 2012; Lawton & Kasari, 2012; Wong, 2013). This assessment has been widely used with autistic children, and developmentally delayed children, and has reported good reliability (Mundy et al., 1994; Mundy, 1995). In order to assess the play skills of the children, many studies (Boyd et al., 2018; Chang et al., 2016; Goods et al., 2013; Wong, 2013) administered the Structured Play Assessment (SPA) (Kasari et al., 2006). Joint engagement was monitored in all studies using observational coding. These observations were video recorded, and later analysed using clearly defined coding protocols. A percentage of video data was independently coded in all studies, and high inter-rater reliability reported. This further contributes to the validity and reliability of each studies' results.

**2.13.5 Intervention.** Five of the six studies (Chang et al., 2016; Goods et al., 2013; Kaale et al., 2012; Lawton & Kasari, 2012; Wong, 2013) implemented the developmental and behavioural social-communication intervention JASPER (Kasari et al., 2006; Kasari et al., 2008) which is considered evidence-based (NICE, 2013). Figure 5 provides an overview of the key principles of this intervention. Boyd et al. (2018) used the Advancing Social-Communication and Play intervention (ASAP) (Watson, Boyd, Baranek & Crais, 2011), which is a social-communication intervention adapted from the

initial Joint Attention and Symbolic Play intervention (JASP) created by Kasari et al. (2008). All studies supported the teachers in choosing individualised goals for children based on their developmental abilities at the time of study. As a result, many of the studies employed a one-to-one model of intervention (Boyd et al., 2018; Goods et al., 2013 Kaale et al., Lawton & Kasari, 2012). The individualised nature of ASAP and JASPER, question the generalisability and feasibility of implementing these interventions into a naturalistic classroom setting where there are limited resources, and/or limited researcher support available. The remaining two studies supported teachers' implementation of the intervention in small group settings (Chang et al., 2016; Wong, 2013). The ability of participating teachers to include the JASPER intervention into their regular timetable is a promising result for the future. However, the child to teacher ratio remained small during implementation, and researcher support within these small group contexts remained consistent over the intervention period. This may question the potential of implementing the intervention in the context of a busy classroom with higher child-teacher ratios. Nonetheless, it remains a promising result, while encouraging future studies to monitor the sustainability of the intervention in the absence of researcher support.

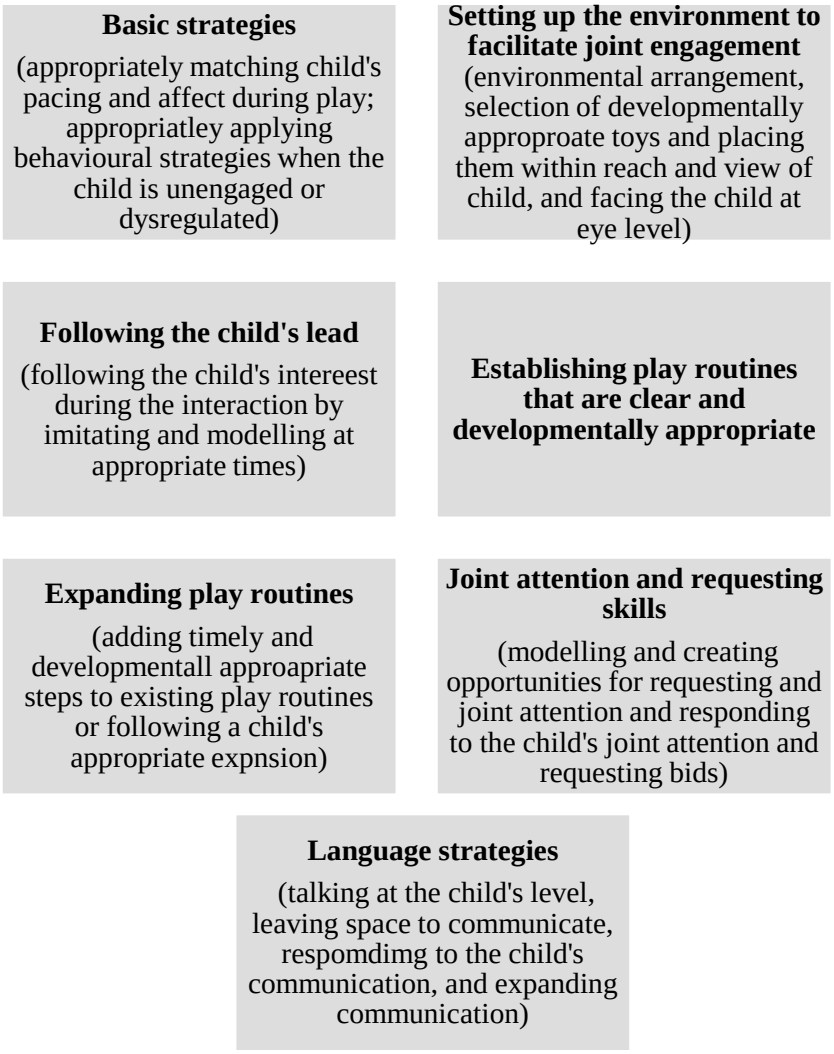



*Figure 5*. Key Components of JASPER (Chang et al., 2016)

***2.13.5.1 Interventionist.*** The current review aims to evaluate the effectiveness of school-based interventions in improving the joint attention deficits of autistic children. While all studies implemented the intervention in the natural school environment, one study employed psychology graduate students as interventionists (Goods et al., 2013). Thus, limiting its relevance to the current review. The remaining five studies employed the teacher as primary interventionist (Boyd et al., 2018; Chang et al., 2016; Kaale et al., 2012; Lawton & Kasari, 2012; Wong, 2013). However, all researchers provided extensive support to staff during the study via on-site coaching, weekly 1:1 sessions, and supervision. Table 7 outlines the level of researcher support given to each study site over the course of the intervention period. This level of researcher support further questions

the feasibility and sustainability of such intervention in the naturalistic setting. Of note, studies evaluating JASPER taught participating school staff specific JASPER strategies to implement. In contrast Boyd et al. (2018) supported the teachers to use their typical methodologies such as DTT to implement the ASAP content.

***2.13.5.2 Intervention length.*** The length of the intervention also varied amongst studies. Boyd et al. (2018) had teachers implement the intervention over the course of the school year. In contrast, the majority of studies operationalised relatively short-term interventions. Duration of intervention ranged from 12 weeks (Goods et al., 2013), eight weeks (Chang et al., 2012; Kaale et al., 2012; Wong, 2013) and six weeks (Lawton & Kasari, 2012). Follow-up was not carried out by the majority of studies, with the exception of Chang et al. (2016). This follow-up was conducted one month post-intervention. Further research is therefore needed to effectively evaluate the long-term effects of implementing joint attention interventions at school.

Table 7

*Summary of Interventions*

| Study | Intervention | Interventionist | Researcher support | Timescale of intervention |
|---|---|---|---|---|
| Boyd et al. (2018) | ASAP | Implemented as an educational team: teacher, paraprofessional and SLT/OT | Classroom staff received two CPD sessions with ASAP staff<br>Received coaching throughout the year<br>Monthly visits from ASAP coaches<br>Interview in-person/skype three times over the course of the year | One academic year |
| Chang et al. (2016) | Modified JASPER | Teachers | Consultation and coaching:<br>Two initial thirty-minute sessions to define targets<br>Eight weeks in vivo coaching sessions<br>JASPER CPD<br>Teachers supported in selecting appropriate toys for intervention<br>Live coaching of teachers during play group<br>During the first four weeks, teachers received two 15 minutes coaching session daily<br>Final four weeks coaching reduced to two to three times a week<br>Weekly handouts of JASPER strategies given to teachers | Eight weeks |
| Goods et al. (2013) | JASPER | Psychology graduates | N/A | Twelve weeks (24 sessions) |
| Kaale et al. (2012) | JASPER | Preschool teacher | Weekly supervision provided to teachers<br>Teachers attended six hours didactic CPD<br>Weekly observation sessions by the researcher | Eight weeks (75-80 sessions) |
| Lawton & Kasari (2012) | JASPER | Teachers | Teachers received JASPER CPD<br>Teachers met with researchers for one hour each week<br>Researcher met with individual children twice a week for 30 minutes | Six weeks |
| Wong (2013) | Joint Attention and Symbolic Play group | Class teacher | Researcher completed weekly brief observations, followed by a session with the teacher | Eight weeks |

### 2.14 Synthesis of Findings:

For the purpose of providing a comprehensive review of the impact of ASAP and JASPER on joint attention and joint engagement skills, the findings from the six included studies will be collated and reviewed below. A summary of these findings is provided in Table 8. The focus of the current review was to identify whether school-based interventions could be successful in teaching joint attention skills to autistic children. Each study also targeted participating children's play skills. However, given the aim of this review, results in relation to play will not be discussed in detail but will also be summarised in Table 8. WoE revealed similar levels of methodological quality and relevance across three of the included studies (Boyd et al., 2018; Goods et al., 2013; Lawton & Kasari, 2012), attaining an overall rating of medium. The remaining studies achieved a high rating (Chang et al., 2016; Kaale et al., 2012; Wong, 2013). Variations in ratings were mainly due to differences in the methodological quality and the relevance of the research to this review's research question.

Table 8

*Summary of Key Findings*

| **Research Study** | **Key Findings** |
|---|---|
| Boyd et al. (2018) | No significant differences in social-communication, joint attention, or play behaviours over time.<br>Significant moderation of change from pre to post in joint engagement skills |
| Chang et al. (2016) | Child initiated joint engagement improved with teachers and peers<br>No significant differences in IJA and Initiating Behavioural Request (IBR) on the ESCS<br>Significant improvement in IJA and IBR during teacher-child play interaction<br>Children spent less time engaged in simple play and engaged in more symbolic play following intervention |
| Goods et al. (2013) | Positive changes in terms of play diversity<br>Significant decrease in time spent unengaged<br>No significant difference in IBR during classroom observation<br>No significant difference pre to post on ESCS |
| Kaale et al. (2012) | Significant effect of JASPER on frequency of joint attention skills during teacher-child play interaction<br>Significant increase in joint engagement during mother-child play<br>No significant effect on joint attention on the ESCS |

| | |
|---|---|
| Lawton & Kasari (2012) | Children in the intervention group used more IJA during class pre to post<br>Significant difference in total IJA from pre to post<br>Significant improvement in object and supported joint engagement<br>Significant increase in 'showing' (IJA) behaviour during ESCS |
| Wong (2013) | Significant difference in joint engagement pre to post<br>Significant differences in IJA, RJA, joint engagement, and symbolic play in classroom observations<br>Significant differences only found in RJA during ESCS and play assessment. |

**2.14.1 Joint attention.** Data were collected pre- and post-intervention in all studies and compared to the control groups. In comparison to their control groups, autistic children who engaged with the JASPER intervention displayed significantly greater joint attention skills in the school setting (Chang et al., 2016; Kaale et al., 2012; Lawton & Kasari, 2012; Wong, 2013). During classroom observations of teacher-child play interactions, significant increases in frequency of IJA behaviours were noted pre to post-intervention (Chang et al., 2016; Kaale et al., 2012; Lawton & Kasari, 2012). Wong (2013) found significant increases in both IJA and RJA following intervention using an adapted version of the JASPER model. This provides promising evidence for the impact of JASPER on joint attention skills in the school setting. During the ESCS, Wong (2013) reported a significant increase in RJA behaviours of children pre to post, while Lawton and Kasari (2012) found an increase in children's showing IJA behaviours. Chang et al. (2016) also noted an increase in children's spontaneous initiation of joint attention post-intervention with teachers and peers. However, despite significant improvements noted in the classroom setting, few significant findings were reported overall in the context of the ESCS (Chang et al., 2016; Kaale et al., 2012; Goods et al., 2013). This may have been influenced by the administration of the ESCS by an unfamiliar tester rather than the class teacher (Chang et al., 2016)

Conversely, Boyd et al. (2018) reported no significant differences in children's joint attention skills following engagement with the ASAP intervention. This was implemented over the course of an academic year, providing the longest intervention duration, in comparison to JASPER which was consistently implemented over a shorter period across studies. However, JASPER was implemented at a more intense rate during

the intervention period than ASAP. This may indicate that intense brief interventions are more successful at improving the joint attention difficulties of autistic children. Another factor to consider is that while Boyd et al. (2018) capitalised on teachers' current strategies to implement ASAP, teachers in the JASPER studies were taught specific strategies. This suggests that engagement in CPD to learn specific joint attention strategies may yield best outcomes.

**2.14.2 Joint engagement.** Engagement in both the ASAP and JASPER interventions produced positive outcomes on joint engagement skills. Two studies reported a significant improvement in joint engagement pre to post during classroom observations (Boyd et al., 2018; Wong, 2013). Lawton and Kasari (2012) observed significant improvements in object and supported joint engagement following participation in the JASPER intervention. Kaale et al. (2012) also found an increase in joint engagement during mother and child play post-intervention. The results of the present studies suggest that joint engagement skills can be effectively taught in the school setting, and the skills learnt during JASPER may be generalizable across contexts.

**2.14.3 Maintenance effects.** Chang et al. (2016) collected follow-up data one month post-intervention. This data found that teachers' application of JASPER strategies to their practice had decreased. This may indicate that the inclusion of such strategies require external support, similar to the support provided by the researcher during intervention. In relation to child outcomes, minor decreases in children's play skills were reported at follow-up. In contrast, no reduction in joint attention was noted. This may support the use of short-term interventions to promote and maintain joint attention skills.

**2.14.4 Implementation fidelity.** Five of the six studies appraised employed teachers as the primary interventionist (Boyd et al., 2018; Chang et al., 2016; Kaale, et al., 2012; Lawton & Kasari, 2012; Wong, 2013). In order for a study to evaluate the true effectiveness of an intervention it needs to ensure the interventionist adheres to the fidelity of the intervention. Mandell et al. (2013) outlined the difficulty in maintaining fidelity when transferring laboratory-based interventions into naturalistic settings. In order to combat this, Mertens (2014) suggests researchers provide adequate training of intervention procedures to implementers and subsequently monitor the extent to which interventionists adhere to such procedures during the study period. All studies within this

review provided training to teachers, and collected data on implementation fidelity. The latter was conducted by blind assessors. Reliability ratings between 0.79 and 0.99 were achieved, highlighting excellent fidelity to the interventions. This highlights the potential feasibility of teachers integrating such intervention procedures with fidelity into their typical routines.

**2.14.5 Social validity.** The measurement of social validity is considered an important feature of intervention research, as it allows the intended interventionist an opportunity to rate the intervention in terms of its feasibility for the naturalistic setting (Mertens, 2014). School-based research has revealed that despite positive results being yielded from specific interventions over the course of a study, teachers frequently report their reticence to continue implementing interventions in the absence of the researcher (Conroy, Stichter, Daunic, & Haydon, 2008). Thus, social validity measures serve an important function in identifying the sustainability of an intervention within school-based research. The majority of studies which implemented JASPER in the school setting did not report upon the social validity of the intervention (Chang et al., 2016; Goods et al. 2013; Kaale et al., 2012; Lawton & Kasari, 2012). Future research is needed to determine the social acceptability of this intervention to the classroom setting. Boyd et al. (2018) reported that teachers and paraprofessionals deemed the ASAP intervention socially acceptable. However, there was insufficient detail given in relation to the self-report measure used to collect this data. Wong (2013) also asked participating teachers to complete a social validity measure regarding the social acceptability of the joint attention intervention in relation to time, ease of implementation, and their confidence in implementing the intervention. Teachers' ratings of acceptability were mixed, with a significant relationship being found between ratings and children's RJA gains. In general, there was little evidence to support the social acceptability of the included studies' interventions. The exclusion of this from school-based research serves to expand the present research to practice gap in educational intervention research (Guldberg, Parsons, Porayska-Pomsta, & Keay-Bright, 2017).

## 2.15 Summary and Implications

The purpose of this systematic review was to evaluate the effectiveness of school-based interventions on the joint attention skills of autistic children. A literature search

was conducted and a total of six studies were identified as meeting the inclusion criteria for review. Studies were evaluated using Gough's (2007) WoE framework. In light of this review, there is evidence to suggest that joint attention interventions can be implemented, effectively, within the school setting. However, only two of six studies implemented the intervention in a small group context (Chang et al., 2016; Wong, 2013). The remaining studies, while reporting successful outcomes were carried out on a one-to-one basis with teachers (Boyd et al., 2018; Kaale et al., 2012; Lawton & Kasari, 2012). As outlined in Table 7, significant researcher support was provided to all teachers over the course of the intervention period. In addition to this, few social validity measures were used across studies. Consequently, follow-up data found a decrease in teachers' use of intervention strategies (Chang et al., 2016). Further studies are required to identify whether the implementation of joint attention strategies could be sustained in the classroom setting over a longer period without receipt of external support. Stahmer, Dababnah, and Rieth (2019) suggest that greater consideration needs to be given to context when transferring ASD interventions from the laboratory setting to the naturalistic environment. If the author is to reflect on the current context, ASD specific classes in Ireland do not have access to the same external supports as those reported by the studies in this review. Furthermore, resources in the Irish ASD class settings do not lend themselves to intensive one-to-one teaching, instead small group teaching is employed. This raises questions as to the appropriateness of the intervention to the current context.

Despite the incongruity between the reviewed interventions and the present context, the importance of targeting joint attention in the school context remains. This led the author to consider alternative interventions to target this core deficit in the school setting. With regard to the pre-existing literature, JASPER has dominated the field in relation to joint attention intervention. However, as discussed earlier, a substantial body of evidence supports the use of ABA, albeit not in the school context, to foster joint attention skills. In Ireland, ABA was previously adopted as a method of educational instruction for autistic children. Thirteen pilot schools were set up in which autistic children were taught using the principles of ABA by psychology graduates and teachers with expertise in the field. The DES did not publish an evaluation of the pilot project but were advised against the adoption of the model going forward (DES Inspectorate, 2006). The DES offers CPD to teachers in the area of ABA through the Comprehensive Applied

Behaviour Analysis (C-ABA) course provided by the NCSE (NCSE, 2019b). However, barriers exist in relation to the effective implementation of ABA approaches in Irish classrooms such as the intensity of intervention, availability of trained practitioners, and access to specialist supervision (Grey, Honan, McClean, & Daly, 2005). Empirical evidence also finds that despite CPD, in DTT, implementation fidelity remains low amongst teachers (Pellechia et al., 2015). Moreover, the majority of methodologies associated with ABA are also based upon one-to-one teaching and learning contexts (Grey et al., 2005). Therefore, teaching joint attention to individual children using ABA is not feasible in the Irish context, where the average class size in primary schools is 24.3, with child-teacher ratios of 15.2:1 in mainstream, and 6:1 in special classes (DES, 2019).

Although the interventions from this review cannot be adopted within the Irish context, the included studies find teachers to be effective interventionists in improving joint attention behaviours of autistic children, when given an intervention to deliver. This empirical evidence, albeit limited, suggests that joint attention can be effectively targeted and improved by teachers in the classroom setting. A dearth of literature pertaining to joint attention practices within the Irish context has been noted throughout this review paper, exemplified by the database search yielding no Irish studies in this area. Due to the critical importance of joint attention to the long-term outcomes of autistic children (Mundy, 2016), it is crucial to explore the way in which these skills may be targeted in the context of Irish schools.

The present need for further investigation of this area relevant to the Irish context prompted the author to conduct a review of the CPD accessible to teachers in Ireland, as a means of identifying potential joint attention interventions. Middletown Centre for Autism (MCA) is a cross-border initiative established in 2007 between the DES in the Republic of Ireland and the DES in Northern Ireland. It is currently funded to support and advise schools and families of autistic children, in addition to providing CPD to parents, teachers, and other professionals (MCA, 2020a). In April 2012, an evaluation report of MCA was issued by the Education and Training Inspectorate and the Inspectorate of the Department of Education and Skills. This report considered MCA to be meeting the needs of autistic children, their parents, and professionals. (Department of Education and Skills Inspectorate; Education and Training Inspectorate – Northern Ireland, 2012). MCA provides CPD for professionals regarding ASD and their associated behavioural,

communicative, and sensory needs (MCA, 2020a). Currently provided, to Irish teachers annually, is a two-day training in Attention Autism, a social-communication intervention which targets joint attention (Davies, 2013; MCA, 2020b).

### 2.16 Attention Autism

Attention Autism is a social-communication intervention model created by Gina Davies, a Speech and Language Therapist in the United Kingdom (UK), to support the development of social-communication skills of autistic children. This intervention model aims to improve the joint attention and joint engagement of autistic children through the use of visual stimuli and highly motivating objects and/or activities in an effort to provide an irresistible invitation for children to share attention and communicate (Davies, 2013). It is designed to be implemented in small groups and is comprised of four stages which the group transition through, sequentially, as their skills develop. An overview of the stages of Attention Autism are presented in Figure 6. Attention Autism aims to teach joint attention skills to the child through capitalising on their current and emerging interests. During stage one and stage two, the children are presented with a variety of novel objects that provide sensory stimulation by moving, producing light, and/or noise. This particular category of objects has been found to be more likely to elicit and support joint attention (Jones & Carr, 2004). The objects used during stage one are novel and the children do not have previous or continued exposure to them. Similarly, the use of novel objects has been found to increase the use of joint attention during interactions (Taylor & Hoch, 2008). Jones and Carr (2004) outlined that teaching joint attention to autistic children should involve a fun routine that involves social looking. The types of materials used and the way in which they are presented during stage one and stage two of Attention Autism, teaches children to look back and forward between an individual and object in an effort to share experiences (Jones & Carr, 2004). Stage three involves an interactive game, the focus of which is to support children in sustaining their attention during their peers' turn, and refocusing their attention once their own turn is finished. Preceding research has successfully taught joint attention skills in the context of turn-taking also (Isaksen & Holth, 2009). The fourth and final stage of the intervention focuses on supporting the children with their ability to shift and refocus their attention. During this stage, an activity is modelled by the class teacher. The children are then supplied with their own individual

packs to replicate the activity at a group table. Once the children complete the activity they return to the group to share their accomplishments with their peers.

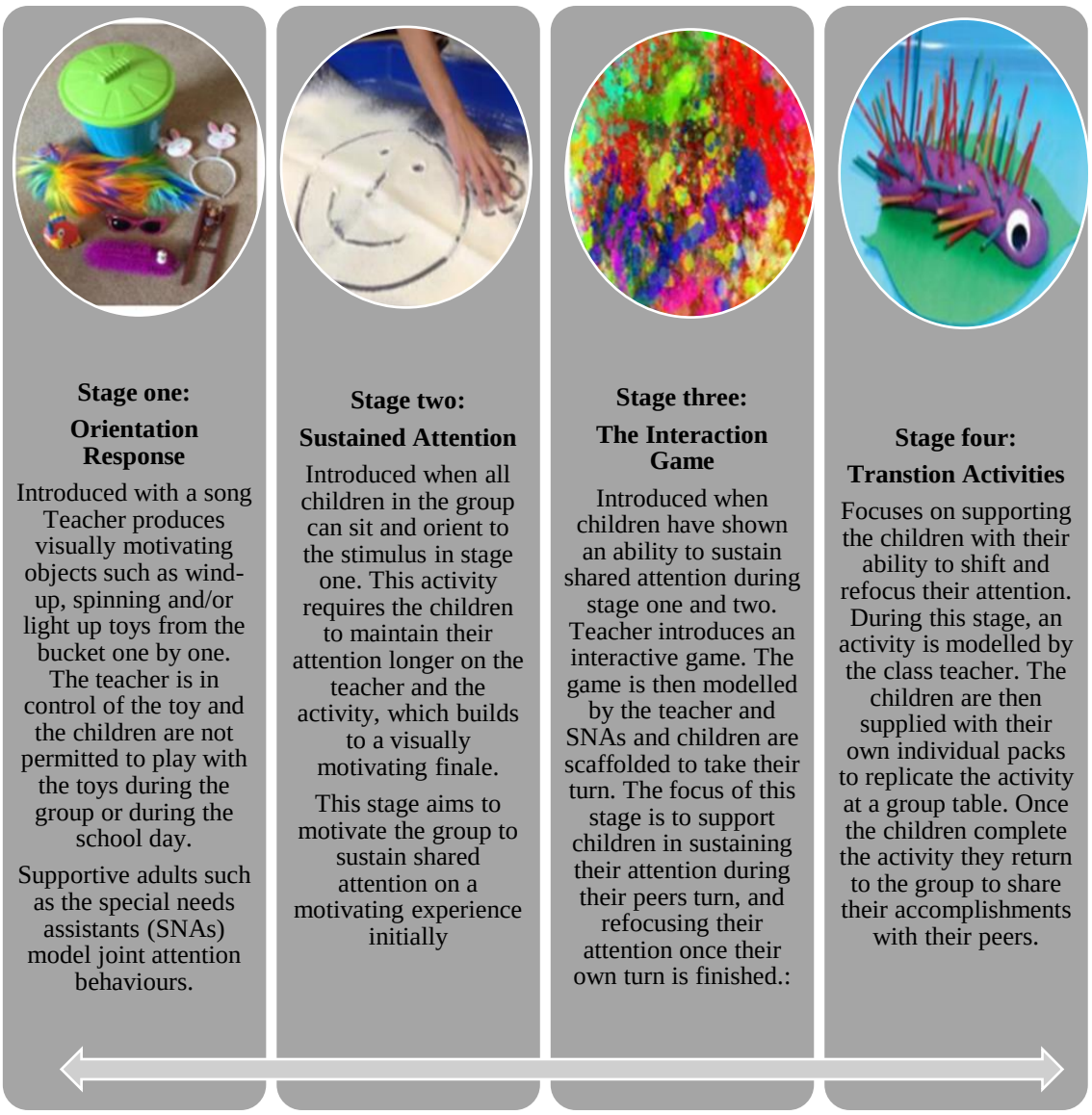



*Figure 6.* Stages of Attention Autism (MCA, 2020; Torbay Council Children's Services, 2020)

**2.16.1 Application of Attention Autism to the current context**. In contrast to the pre-existing social-communication interventions which target joint attention, Attention Autism was created specifically for implementation in the small group setting in the ASD classroom (Davies, 2013). Furthermore, Egan (2018) suggests that the strategies used in Attention Autism are in keeping with the Standards and Components of

Síolta, the National Quality Framework for Early Childhood Education (CECDE, 2006), and Aistear, the Early Childhood Curriculum Framework (National Council for Curriculum and Assessment (NCCA), 2009), in Ireland. Egan (2018) further highlights the applicability of the approach to the 'Interactions' component within the NCCA's Guidelines for Good Practice (NCCA, 2009).

**2.16.2 Psychological underpinnings.** Attention Autism is considered an eclectic approach to ASD intervention (Davies, 2013). Current educational research proposes that in order to create a responsive pedagogy, we must possess an understanding of the ways in which children learn (Ring, O' Sullivan, Ryan, & Burke, 2018). In light of this, the author will conjoin the methodologies used in Attention Autism to pre-existing learning theory. Firstly, if we are to consider the definition given earlier, of developmental approaches to intervention, Attention Autism may fit within this category. Vygotsky (1962), observed that learning occurs in the context of social interactions with others. He suggested that it was through children's interactions with a 'more knowledgeable other' that learning and development were enhanced, and thus introduced the concept of the zone of proximal development (ZPD). Vygotsky (1978) defined the ZPD as the difference between the child's current skill level and what they could achieve with the support of others. This theory is known today as the Socio-Cultural Developmental theory, which affirms that children's learning is enriched through the use, and internalisation of cultural tools, i.e. language, combined with interactions with the more knowledgeable other (Ring et al., 2018). Attention Autism is a child-led approach, whereby the joint attention interaction is led by the child initially, by means of capitalising on their current, and emerging interests, with the goal of guiding the child to share experiences with their teacher (Egan, 2018).

As noted in the previous section, the interaction between child and adult is central to the learning process. However, the Reggio-Emilia approach to education suggests that there may be another influential educator. This approach conceptualises the classroom as possessing three educators; the child, the teacher, and the environment (Strong-Wilson & Ellis, 2007). This was further extended by Pairman and Terreni (2001) who identified three central features to the environment in education; the physical, the temporal, and the interactional environment. Ring (2018), provides an overview of the physical, temporal, and interactional environment, and encapsulates the importance of these key features to

the education of autistic children. The author will next describe the potential ability of Attention Autism to embrace the concept of environment as educator.

Ring (2018), highlights the layout of the physical environment as influential to autistic children's engagement. Attention Autism CPD also advocates for the physical environment to be free from distraction when implementing the intervention. The temporal environment is concerned with the inclusion of routine and structure into the child's physical environment. Ring (2018), recognises the inclusion of visuals as a means of improving the temporal environment for autistic children. The use of visual strategies has been found to assist autistic children's comprehension of expectations, demands, and sequences of activities, and reduce anxiety (Ganz, Bourgeois, Flores & Campos, 2008). Visual cues also reportedly promote attention to social-communicative information (Quill, 1997). Prior to Attention Autism, a whiteboard is used to display the steps of the intervention to the children using line drawings, and each activity is crossed out as it is completed by the teacher. All activities used during the intervention stages are visual in nature, and teachers are directed during the CPD, in this intervention, to use minimal language. The emphasis placed on visuals within the Attention Autism intervention, therefore, capitalises on the visual learning style of autistic children (Egan, 2018) and ensures the appropriate temporal environment is provided. As stated, the learning environment is enhanced by interactions between teacher and child. Ring (2018), describes the interactional environment for autistic children as the quality of social interactions children experience, in addition to the extent to which these interactions are informed by a knowledge and understanding of the implications of ASD. The content and strategies of Attention Autism are underpinned by the knowledge of the core deficits associated with ASD i.e. social-communication, joint attention, and joint engagement (Chang et al., 2016), the incorporation of which may enhance the interactional environment.

**2.16.3 Empirical evidence.** A literature search was conducted to identify the current evidence base for Attention Autism as an intervention. An initial search using the online databases PsychInfo® (APA, 2020), PsychArticles® (APA, 2020), ERIC (Institute of Education Sciences, 2020), and Academic Search Complete (EBSCO, 2020) generated no results. It was discovered that despite MCA providing CPD in the intervention, and teachers including the intervention within their current practice, Attention Autism has not

undergone rigorous efficacy testing to date. Research in this area is currently limited to masters-level theses and action research conducted by schools in the UK. Morgan (2011) completed her thesis on the effectiveness of Attention Autism on the attention, communication, and independence of autistic children, and this research was therefore not relevant to the current review question. Buckingham (2012) and Courtman (2018) implemented Attention Autism in their respective classrooms for a period of six weeks with children aged three to nine years. An overview of the research design, participant, measures, and outcomes can be found in Table 9 below.

Table 9

*Summary of Attention Autism Studies*

| **Study** | **Participants** | **Design** | **Measures** | **Outcomes** |
|---|---|---|---|---|
| Buckingham (2012) | Autistic children with comorbid complex learning difficulties aged 6-7 years (*n* = 8) | Action research using a case study design | Teacher observation<br>Teacher completed assessment sheets | On average children's joint attention scores increased by 29% following the six week intervention period |
| Courtman (2018) | Autistic children (*n* =4) and children with intellectual disability (*n* =2) aged 8-9 years. | Quasi-experimental pre-test post-test design | Video recorded observations once a week.<br>Coded for joint attention behaviours (eye gaze and pointing)<br>Teacher assessment sheet tallying time spent engaged | Children were reportedly using joint attention behaviours twice as much as they were at baseline following intervention |

Both studies reported increases in joint attention skills following the six-week intervention. However, the aforementioned results must be interpreted with caution due

to the substantial limitations of the studies' methodologies. Firstly, neither study employed a control group. Therefore, it is difficult to decipher whether improvements in joint attention skills are attributable to engagement in the intervention or maturation (Mertens, 2014). Secondly, given the nature of action research, both Buckingham (2012) and Courtman (2018) were the primary interventionist and the primary researcher within their studies. Additionally, both studies used teacher observation and assessment sheets to report outcomes, which may have compromised the validity of the study results due to possible researcher bias (Suter, 2011). At this point, Attention Autism may be best regarded as an evidence-supported approach due to its inclusion of evidence-based ASD strategies (Robinson, Bond & Oldfield, 2017).

### 2.17 Conclusions and Implications

The current review outlined the pivotal role joint attention plays in early development, in addition to the atypical developmental trajectory of joint attention skills which presents in autistic children (Charman, 2003; Mundy, 2016). Current literature indicates that the acquisition of joint attention skills leads to better developmental outcomes for autistic children in the areas of social interaction, language, friendships, and cognition (Bottema-Beutel et al., 2014; Goods et al., 2013; Mundy, Gwaltney, & Henderson, 2010; Wong, 2013). Although the absence of joint attention skills is hugely inhibiting in an educational context (Mundy & Newell, 2007), there is a dearth of literature examining school-based joint attention interventions, teacher knowledge, and educational practices in relation to joint attention at a national and international level (Chang et al., 2016; Wong & Kasari, 2012).

In Ireland, EI classes in mainstream schools cater for autistic children from three to five years of age. In the current context, the age at which attending school becomes compulsory is six, however, the majority of children begin primary school at four or five years of age (Ring et al., 2016), Henceforth, children spend the majority of their time in an educational setting. As a result, it is paramount that we optimise this time and target joint attention in the school setting. However, a gold standard approach to teaching joint attention skills to autistic children has, thus far, not been established. It remains unclear which intervention, type of participant, or interventionist yields the most positive results (Murza et al., 2016). The current review finds promising evidence for the potential of

implementing JASPER (Chang et al., 2016; Kaale et al., 2012; Lawton & Kasari, 2012) and ASAP (Boyd et al., 2018) into the school setting to effectively teach joint attention. However, there is currently no training in these approaches available for Irish teachers to access. Additionally, the reviewed studies utilised a one-to-one intervention model (Kaale, Smith, & Sponheim, 2012; Lawton & Kasari, 2012). This suggests that the JASPER and ASAP interventions are not currently applicable to the ASD class setting in Ireland as current classroom ratios and demands necessitate the use of small group teaching as the primary mode of pedagogical delivery. This review identified Attention Autism (Davies, 2013), as a classroom-based social-communication intervention presently implemented within ASD class settings in Ireland. However, it has not undergone efficacy testing. In light of the findings of this review, it appears pertinent that future research be conducted to identify whether the Attention Autism intervention can effectively foster joint attention skills in the school context for autistic children.

# Part Two: Empirical Paper

## Introduction

### 3.1 Joint Attention and Joint Engagement

Joint attention is the ability to share attention with a communicative partner regarding a mutual focus of interest, for the purpose of social sharing (Mundy, 1995). It is an early social-communicative skill, usually acquired by children aged between nine to 18 months, as they developmentally become motivated to interact with adults regarding interesting objects in their environments (Jones & Carr, 2006). As a construct, it is often defined in the literature as nonverbal communicative behaviours used to initiate joint attention with another (i.e. eye gaze, gaze alterations, showing, pointing), and respond to another's bid for joint attention (i.e. following line of regard, response to name). These behaviours constitute the forms of joint attention which are defined as Initiation of Joint Attention (IJA) and Response to Joint attention (RJA). However, these behaviours can serve a proto-imperative or proto-declarative function. Proto-imperative exchanges involve an individual referencing their communicative partner and an object in order to request the object. The function of a proto-declarative exchange differs as it involves a triadic exchange between individual, communicative partner, and object/event for the purpose of social sharing (i.e. showing, commenting) (Charman, 2003).

More recently, research has defined joint engagement as the ability to engage in and sustain joint attention interactions with a communicative partner and object/event (White et al., 2011). This state of joint engagement is comprised of two forms: supported and coordinated. Supported joint engagement is when the child is actively involved with the same object or event as their communicative partner but are not overtly acknowledging the role of the communicative partner. Coordinated joint engagement is a more sophisticated engagement state and typically increases from six months to 18 months. It involves the child and communicative partner being jointly engaged with the same object and event, and the child actively and repeatedly acknowledging their communicative partner in the interaction (Adamson, Deckner, & Bakeman, 2010).

### 3.2 Joint Attention and Autistic Spectrum Difference

Significant difficulties with social-communication are a primary diagnostic criteria for ASD (American Psychiatric Association (APA), 2013). Preceding research has identified joint attention as one of the fundamental behaviours influencing social-communication competency in autistic children (Murdock, Cost, & Tieso, 2007; Sutton, Webster, & Westerveld, 2018). Significant differences in joint attention abilities have been noted amongst autistic children, in comparison to typically developing children and children with developmental delays (Mundy et al., 1986; Bruinsma, Koegel & Koegel, 2004; Wong & Kasari, 2012). Therefore, leading to joint attention deficits being recognised as a core social-communication deficit, associated with an ASD diagnosis (Lawton & Kasari, 2011; Mundy, 1995; Murza, Schwartz, Hahs-Vaughn & Nye, 2016) and a diagnostic and prognostic indicator for autistic children (Sullivan et al., 2007). Acquisition of joint attention skills also has theoretical importance as it has been identified as central to the understanding of others mental representations (Kasari et al., 2006). Literature has positioned joint attention development within the social cognitive model of ASD, due to its influence on later ToM abilities (Mundy, 2016).

Numerous research studies focus on the core deficits associated with ASD; joint attention, joint engagement, language, and play skills (Chang et al., 2016). Effecting change in relation to these core deficits is considered vital, as enhancement in these areas are associated with improved developmental outcomes (Wong & Kasari, 2012). Joint attention skills are foundational to the later acquisition of spontaneous speech, social initiations, functional, and symbolic play skills (Bottema-Buetel et al., 2014; Goods et al., 2013; Whalen, Schreibman, & Ingersoll, 2006). Joint attention interventions would, therefore, operate as a more efficient intervention plan, as they obviate the need to teach a cluster of skills separately (Charman, 2003; White et al., 2011).

### 3.3 Joint Attention and School

Extensive ASD research has provided a robust account of the constellation of difficulties that autistic children can present with in the classroom setting (Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010; Sparapani et al., 2016). Joint attention deficits may considerably influence and exacerbate these difficulties in the classroom context. The basis of joint attention is the ability to coordinate attention between one's

social partner and an object and/or event of interest (Mundy, 1995). The delivery of classroom instruction relies on this ability consistently, as students are expected to coordinate their attention between their teacher and the lesson they are delivering (Mundy & Newell, 2007).

Autistic children may struggle with responding and attending to relevant classroom stimuli, and display a tendency to pay less attention to social stimuli such as faces (Sparapani et al., 2016). This may be explained, at least in part, by their difficulties with joint attention. The inability to initiate and respond to joint attention may also hinder children's ability to participate in classroom-based discussion (Dawson, 2004; Rotheram-Fuller et al., 2010). Peer-tutoring and peer-based learning are common methodologies used in contemporary classrooms. Autistic children may find it difficult to engage with this methodology due to their difficulties initiating and responding to their peers (Sutton et al., 2018), further highlighting the importance of joint attention skills in the classroom setting. Active engagement within the classroom setting has been linked to academic achievement (Sparapani et al., 2016). In a recent study of autistic children's use of play and joint attention behaviours in a special preschool, it was found that autistic children spent more time in an unengaged state than their typically developing and developmentally delayed peers (Wong & Kasari, 2012). Similarly, this disengagement may be better explained by the difficulties autistic children experience with joint engagement.

The efficacy of EI on the intellectual and behavioural functioning of autistic children is well established in the psychological literature (Bradshaw, Steiner, Gengoux, & Koegel, 2015; Dawson et al., 2010; Sallows & Graupner, 2005; Sutera et al., 2013). However, given the pervasive and lifelong implications of ASD, this emphasis on EI research has at least, in part, neglected the needs of older autistic children, adolescents, and adults (Parsons et al., 2009). This is particularly true in relation to joint attention intervention studies. The majority of joint attention research has targeted preschool autistic children, ranging in age from two to five-year-olds. This is due to the presence of atypical RJA and IJA behaviours being less conspicuous in older autistic children (Lord & Jones, 2012). During the preschool period, poor joint attention is highlighted by behavioural indicators such as atypical eye contact and pointing (Mundy, 2016). This atypical presentation of joint attention behaviours may become less pronounced due to

maturation (Mundy et al., 2017). This may be better explained by the transition from overt joint attention behaviours to the development of mental joint attention processes (Mundy, 2016). Mental joint attention processes include referential language use, social cognition, and the ability to focus on a common referent to learn from the instruction of others (Mundy, 2016). Therefore, joint attention difficulties may not be truly absent in older autistic children, instead our conceptualisation of their presence in older children, may be limited (Mundy et al., 2017). Joint attention interventions are considered a developmentally appropriate intervention for younger autistic children. However, autistic children's need for support with this core deficit persists beyond the preschool period and has been identified as a prerequisite to later development of ToM (Mundy, 2016). Conversely, if targeted joint attention intervention is not received during the preschool period, and not offered during the school-age period, interventions targeting higher-level skills such as ToM may be ineffective (Parsons et al., 2009). Thus, highlighting the necessity in identifying and developing effective practices for school-aged autistic children, based upon developmental need and ability, irrespective of chronological age (Hungate, Gardner, Tackett, & Spencer, 2019).

### 3.4 School-based Joint Attention Interventions

Early intervention studies targeting joint attention have primarily been parent (Kasari, et al., 2010; Schertz & Odom, 2007; Scertz, Odom, Baggett and Sideris, 2013) and/or researcher mediated (Kasari et al, 2006, 2008; Whalen & Scriebman, 2003). While the aforementioned studies yielded positive results, there is a dearth of literature examining school-based joint attention interventions, teacher knowledge, and educational practices in relation to joint attention (Chang et al., 2016; Wong & Kasari, 2012). Despite the impact poor joint attention skills have on academic achievement, and classroom participation, the average preschool curricula, and practices do not overtly target social-communication skills (Hess, Morrier, Heffin, & Ivey, 2008; Keen Sigafoos, & Woodyatt, 2005). Within the Irish context, evidence-based ASD specific strategies such as ABA, Picture Exchange Communication System (PECS) (Bondy & Frost, 1994), and Treatment and Education of Autistic and related Communication Handicapped CHildren (TEACCH) (Mesibov, Shea & Schopler, 2005) are being implemented in the ASD class setting (Daly et al., 2016). However, there is little evidence to suggest that joint attention skills are presently included in curriculum planning (Wong & Kasari, 2012).

A gold standard approach to teaching joint attention skills to autistic children has thus far not been established (Murza et al., 2016). The majority of school-based intervention research in the area evaluated the efficacy of the Joint Attention Symbolic Play Engagement Regulation (JASPER) intervention model (Kasari et al., 2006, Kasari et al., 2008). This is considered an evidence-based social-communication intervention (National Institute for Health and Care Excellence (NICE), 2013). The Review Paper, of this thesis, documented concerns regarding the feasibility and applicability of the JASPER intervention within the ASD class setting, in Ireland. Although, all studies reviewed were conducted in the school setting, the primary interventionists were sometimes the researchers as opposed to the teachers (Goods et al., 2013; Kasari et al., 2006). Furthermore, the majority of the studies utilised a one-to-one intervention model (Kaale, Smith, & Sponheim, 2012; Lawton & Kasari, 2012). This could impact the transference of this intervention model to the Irish context, as current classroom ratios, and demands necessitate the use of small group teaching as the primary mode of pedagogical delivery. Finally, the research studies reported good implementation fidelity of teachers to the intervention, however, limited data in relation to social validity was reported.

### 3.5 Attention Autism

There is a dearth of research regarding school-based practices in relation to joint attention, particularly in the Irish context. The aforementioned JASPER intervention is not available for use in Ireland, and questions also remain regarding its feasibility for the current educational context. However, Attention Autism is a social-communication intervention model (Davies, 2013) being used within the current context. This intervention model aims to improve the joint attention and joint engagement of autistic children through the use of visual stimuli and highly motivating objects and/or activities in an effort to provide an irresistible invitation for children to share attention and communicate (Davies, 2013; Middletown Centre for Autism (MCA), 2020b). It is designed to be implemented in small group settings. It involves four stages which aim to develop and sustain shared attention. Teachers can access two-day continuing professional development (CPD) on this intervention model with the Middletown Centre for Autism, in Ireland. It has become a well-known intervention amongst Irish and UK ASD teachers, with online forums dedicated to the sharing of ideas for Attention Autism

groups. Although practice-based evidence for Attention Autism exists (Buckingham, 2012; Courtman, 2018; Morgan, 2011), presently there are no peer reviewed studies examining the efficacy of this intervention.

### 3.6 Research to Practice

Contemporary literature has illuminated the research to practice gap which exists within ASD intervention research (Guldberg, Parsons, Porayska-Pomsta, & Kaey-Bright, 2017). In addition, the existing barriers to the delivery of intervention-based efficacy research for autistic children such as the level of staff training required, child-teacher ratios, and feasibility, have been delineated (Morgan et al., 2018; Mandell et al., 2013). Kasari and Smith (2013), articulate the need for researchers and schools to collaborate, in order to understand how effective ASD interventions can be developed which are responsive to the needs of individual school contexts. The implementation of research in the real world setting increases the overall beneficence of the study, by capitalising on the potential relevance the results will have to the setting, thereby contributing positively to the children (Locke, Kang-Yi, Pellecchia, & Mandell, 2019). Therefore, it is essential that intervention research be conducted in the setting in which it will be delivered i.e. the classroom by the personnel who will implement the intervention consistently i.e. the teacher (Morgan et al., 2018). The research designs most regularly used in education research are embedded within a knowledge transfer model of evidence-based practice, whereby the research is conducted by the researcher and is later conveyed to educational professionals, to facilitate their implementation of evidence-based interventions (Guldberg et al., 2017). Although this research design and model provide important knowledge, a gap between research and practice is created due to the differing priorities of educational professionals and researchers (Guldberg et al., 2017).

The social validation of an intervention is therefore a crucial element to evaluate during intervention research. The use of social validity measures offers the intended interventionists an opportunity to rate an intervention in relation to its usefulness, feasibility, and applicability to the intended intervention setting (Mertens, 2014). If an intervention is viewed as socially acceptable and displays suitable methodologies, the probability of sustained implementation increases (Mertens, 2014). Social validity measures used in classroom-based research studies have discovered that despite teachers'

acknowledgement that a particular intervention yielded positive behavioural changes, often teachers revealed that they would not continue to use the intervention in the absence of the researcher (Conroy, Stichter, Daunic, & Haydon, 2008). This further highlights the importance of measuring social validity, in school-based research.

### 3.7 Rationale

There are a number of research problems evident in relation to joint attention research. Firstly, although extensive research exists regarding the implications of poor joint attention skills for autistic children, a gold standard intervention to target this core deficit has not yet been identified (Murza et al., 2016). Secondly, a dearth of research exists in relation to school-based joint attention interventions, particularly in an Irish context. Given the length of time children spend in school across the lifespan, and the impact poor joint attention has on academic outcomes, classroom engagement, and participation (Sparapani et al., 2016), it appears pertinent to contribute to the evidence base in this area. Preceding research has focused on the promotion of joint attention during the preschool period. However, joint attention is a pervasive and lifelong deficit, therefore, the inclusion of school-age children in joint attention research is imperative. Thirdly, Attention Autism is a social-communication intervention model currently being used to promote joint attention skills in Irish ASD class settings. However, this intervention has not undergone rigorous efficacy testing. Hence, intervention studies investigating the efficacy of Attention Autism are warranted. Finally, current ASD intervention research in the area contributes to the ever-growing research to practice gap. In order to bridge this gap, research studies require the active participation of the intended interventionists, in the naturalistic setting. Furthermore, the opinion of experienced teachers regarding the social acceptability of interventions, for the school environment, should be sought.

### 3.8 Present study

The current study aims to address the above research problems. This study is the first examination of the implementation of the Attention Autism intervention model in an Irish context. In this study, Attention Autism was implemented by two teachers in ASD specific classrooms for a period of six weeks. In this quasi-experimental design, the primary aims were to determine whether preschool and school-aged autistic children who

received Attention Autism intervention demonstrated greater improvements in (a) joint attention, and (b) joint engagement in comparison to autistic children in a control group. Additionally, the study explored whether Irish teachers considered Attention Autism as a feasible and appropriate intervention for the ASD classroom.

# Methodology

## 3.9 Participants

**3.9.1 Recruitment of participants.** Non-probability, purposive sampling was utilised. The list of schools who possess a special class for autistic children was accessed by the researcher. This list is updated annually and is provided by the National Council of Special Educational Needs (NCSE, 2019a). Schools possessing junior ASD classes and EI ASD classes were the target population. A junior ASD class in Ireland caters for autistic children aged four to eight years. Early intervention ASD classes cater for three to five year olds. The researcher contacted schools in the Republic of Ireland which met these criteria, by email, to request institutional permission and identify interest. This email was followed with a phone call to complete an initial telephone screening. Following this, teacher and parent information letters and consent forms were sent. A copy of these information letters and consent forms are provided in Appendix C and D. Consent forms were signed prior to beginning the study protocol. Information letters and consent forms were adapted to become age-appropriate, and child assent was sought, an example of this assent form can be found in Appendix E. The concept of 'provisional assent' (Flewitt, 2006, p.31), was adopted when interacting with the children in the study. Recruited from special classes for autistic children in the Republic of Ireland, participants included 20 autistic children and their teachers. Figure 7 provides a visual of this recruitment process.

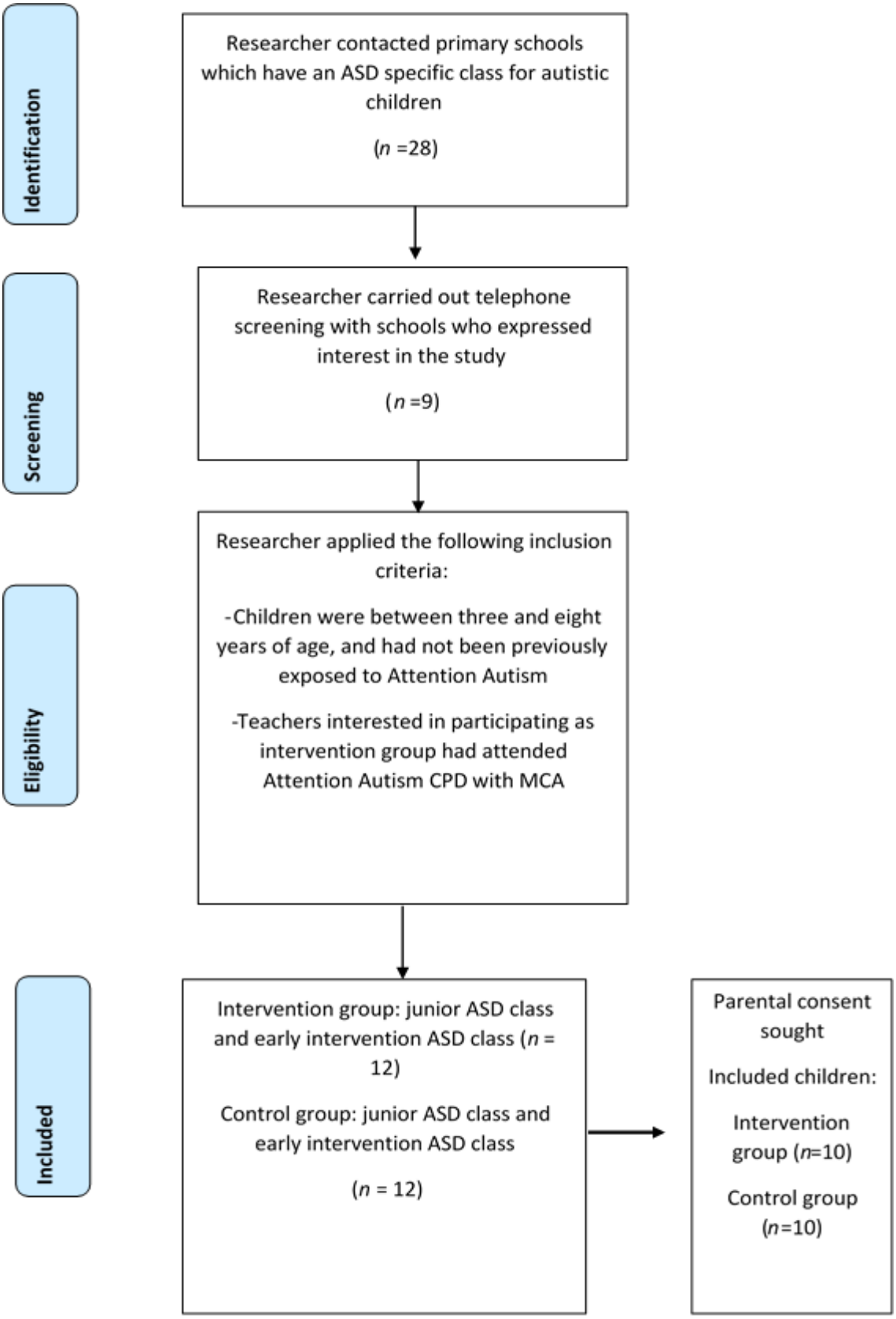



*Figure 7.* Recruitment Process

**3.9.2 School setting.** Four classrooms, catering specifically for autistic children, were included in the study. Two junior and two EI ASD classes participated. The intervention group consisted of a junior ASD class, and an EI ASD class, where teachers had engaged with Attention Autism CPD. The control group included a junior ASD and an EI class group. Each classroom had three adults. This included the special education teacher and two special needs assistants (SNA's). The student-teacher ratio was 6:1 in each classroom. All classrooms in the study used a combination of the Primary School Curriculum (NCCA, 1999), The Assessment of Basic Language and Learning Skills-Revised Edition (ABLLS-R) (Partington, 2010), and/or Verbal Behaviour Milestones Assessment and Placement Program (VB-MAPP) (Sundberg, 2008). Teachers also reported using elements of Aistear, the early childhood curriculum framework (NCCA, 2009).

**3.9.3 Children.** Included children: (a) had a clinical diagnosis of ASD from a qualified psychologist, (b) were between 3 and 7 years of age, and (c) were enrolled in a special class for autistic children in a mainstream school in the Republic of Ireland. As Table 10 details, on average the 20 children were five years old (M = 5.30; SD = 1.26) and 80% were male. The majority of children in the study were Irish (*n* = 17). All children had a verbal mental-age of below 36 months. According to parent questionnaires and reports from class teachers, participating children were not engaging in any external intervention, to the study. Due to the age of the sample, the majority of participating children were waitlisted for cognitive assessment (*n* = 12). Autistic children with comorbid mild (*n* = 6) and moderate (*n* = 2) intellectual disability also participated in the study.

Table 10

*Child Demographics*

| Demographics | Participants<br>*n* = 20 |
|---|---|
| Chronological age | 5.30 (1.26) |
| Gender (males/females) | 16/4 |
| Ethnicity (Irish/other) | 17/3 |
| Verbal Mental Age | < 36 months |

**3.9.4 Teachers.** Included teachers were (a) employed by the Department of Education and Skills (DES), (b) had a minimum of two years teaching experience in an ASD class setting, and (c) were available to participate in the research. The teachers in the intervention classrooms were required to have (d) previously engaged with Attention Autism CPD, and (e) be willing to implement the Attention Autism intervention at least three times a week for fifteen minutes over a six week period. Table 11 summarises descriptive sample information.

Table 11

*Teacher Characteristics*

| | Intervention<br>*n* = 2 | Control<br>*n* = 2 |
|---|---|---|
| | *M* (*SD*) | *M* (*SD*) |
| Age | 31.00 (2.83) | 37.50 (3.54) |
| Years Qualified | 10.00 (4.24) | 16.50 (2.12) |
| ASD Experience | 4.00 (1.41) | 3.00 (1.41) |

## 3.10 Design

The aim of the current study was to evaluate the efficacy of the Attention Autism intervention on the joint attention, and joint engagement skills of preschool and school-age autistic children. Participating children were recruited from four different schools in varying geographical locations in the Republic of Ireland. The use of a Randomised Controlled Trial (RCT) was, therefore, not feasible. In this study, classrooms in which teachers had completed Attention Autism CPD were assigned to the intervention group and classrooms in which the teachers had not received CPD in Attention Autism formed the control group. A quasi-experimental pre-test post-test design was implemented as it preserves much of the rigor of experimental designs, while also allowing for the use of pre-existing groups in conditions (Mertens, 2014).

### 3.11 Procedures

Following the informed consent process, teacher and parent demographic forms were distributed, completed, and collected. Pre-assessment data of children's joint attention skills, joint engagement states, and verbal mental-age were collected at study entry. Participants in the intervention group received three weekly sessions of Attention Autism for fifteen-minute intervals over a period of six weeks. The intervention was provided by the ASD classteacher and supported by the special needs assistants in the ASD class setting. Attention Autism comprises four stages which children transition through, sequentially, as their skills develop. It is recommended that the next stage of the intervention is only introduced when the children display a readiness to progress (MCA, 2020b). Over the course of the six-week intervention period of this study, the children progressed to stage three of the Attention Autism intervention. Table 12 provides an overview of stages one to three. Participants in the control group, acted as a treatment-as-usual group, and received their regular school curriculum for the six week intervention period. At the end of the six week intervention period, post-assessment data of children's joint attention skills and joint engagement states were collected by the researcher.

Table 12

*Attention Autism Stages*

| Stage | Definition of stage |
|---|---|
| Stage one: Orientation response | Introduced with a song and visual schedule of activities. The teacher produces visually motivating objects such as wind-up, spinning, and/or light-up toys from the bucket one by one. The teacher is in control of the toy and the children are not permitted to play with the toys during the group or during the school day. Supportive adults (SNA) model social-communication behaviours. |
| Stage two: Sustained attention activity | Introduced when all children in the group can sit and orient to the stimulus in phase one. This activity requires the children to maintain their attention longer on the teacher and the activity, which builds to a visually motivating finale. |
| Stage three: | Introduced when children have shown an ability to sustain shared attention during phaseone and two. An interactive game is introduced. |

| | |
|---|---|
| Shifting attention and turn-taking | The game is then modelled by the teacher and SNA and children are scaffolded to take their turn. The focus of this phase is to support children in sustaining their attention during their peers' turn and refocusing their attention once their own turn is finished |

### 3.12 Measures

**3.12.1 Demographics.** Parents/guardians were asked to complete a demographic questionnaire to provide information regarding characteristics of their child, history of intervention, and interventions that their child may be receiving, parallel to the study. Teachers completed a questionnaire designed to collect data on teachers' demographics including age, gender, ethnicity, highest level of education, and years of special educational teaching experience.

**3.12.2 Verbal mental age.** The verbal subtests of The British Ability Scales (BAS3) (Elliot & Smith, 2011), were administered at study entry to measure children's receptive and expressive language. Age equivalent scores were calculated for each child.

**3.12.3 Early Social Communication Scales (ESCS).** The Early Social Communication Scales (Mundy, Delgado, Block, Venezia, Hogan & Seibert, 2003) is a 15-20 minute semi-structured assessment, designed to measure social-communication skills. This assessment has been widely used with autistic children and developmentally delayed children. The ESCS was used in the current study to identify the children's RJA and IJA skills. The ESCS was administered at study entry and exit, by the researcher, in the children's school. The ESCS was video recorded and later scored using the ESCS manual. Appendix F outlines the code summaries for RJA and IJA from the ESCS manual, used by the researcher for coding. In Appendix G, the ESCS coding sheet used by the researcher is provided. Studies have shown ESCS to have good reliability (range = 0.61- 0.91) (Mundy et al., 1994; Mundy, 1995).

**3.12.4 Classroom observation.** Classroom observations were conducted in structured group contexts within all classrooms, at study entry, and exit. In the intervention classrooms, children were observed during an Attention Autism group, and during another teacher led group at study entry and exit. In the control classrooms, children were observed during a teacher led group at study entry and exit. All observations

were video recorded and later coded by the researcher using an engagement state coding protocol adapted from Adamson, Bakeman, and Deckner (2004). This engagement state coding protocol has reported high reliability and validity and is considered sensitive to changes generated by intervention, in autistic children (Adamson et al., 2004; Wong and Kasari, 2012). Engagement states were coded as unengaged, supported joint engagement, or coordinated joint engagement. The definitions of these engagement states are outlined in Appendix H. Timed event recording was used to identify the duration in which children spent in each engagement state during circle time and Attention Autism groups. Timed event recording was chosen due to its ability to enhance the richness of data collected, by providing the researcher with a precise and authentic account of the desired behaviours. Additionally, it offers a more diverse range of analytic options (Bakeman & Quera, 2011). Furthermore, research indicates that the use of event recording is most effective when coding for low frequency behaviours (Sam, Reszka, Odom, Hume, & Boyd, 2015). Joint attention and joint engagement have been found to occur at a lower frequency in the classroom setting by autistic children in comparison to children in a mixed disability group (Wong & Kasari, 2012), providing a further rationale for the employment of an event-based recording system. The time sampling record sheet created and used by the researcher is provided in Appendix I.

A frequency count of spontaneous IJA behaviours (pointing, showing, and alternating gaze) and RJA behaviours (following a point or line of regard) were tallied for each child during coding of their classroom observation video pre- and post-intervention. A copy of the coding definitions used are also included in Appendix H. Frequencies of these behaviours were also tallied for the intervention group, during Attention Autism pre and post.

**3.12.5 Interrater reliability.** In an effort to ensure reliability of observation, a Doctorate student, independent to the research study, coded 20% of the ESCS video data and 20% of the group video data. Appendix J details the coding process undertaken by the primary researcher and the independent coder. The overall intra-class coefficient (ICC) for joint attention was 0.83, and 0.94 for joint engagement.

**3.12.6 Social validity questionnaire.** A researcher designed questionnaire was utilised to identify the potential social validity of the Attention Autism intervention

model for the ASD classroom. This measure is presented in Appendix K. This questionnaire consisted of two sections. The first section contained items relating to demographic information such as gender, number of years as a qualified teacher, number of years teaching autistic children, length of time they have been including Attention Autism into their practice, and age group of children they have used the intervention with. The second section of the questionnaire asked teachers to rate the feasibility, cost effectiveness, probability of continuation, perceived usefulness, and effectiveness of the Attention Autism intervention in the ASD classroom, using a five-point Likert scale (Mertens, 2014). As outlined in Figure 7, the author contacted 28 primary schools in relation to the current study. Some schools declined to participate as they were unable to facilitate the project and/or teachers had already been using Attention Autism and were therefore ineligible for the study. However, many teachers expressed their interest in the study and agreed to complete a questionnaire regarding their experiences implementing Attention Autism. The social validity questionnaire was sent to all teachers who expressed interest ($n$= 25). Both intervention teachers participating in the study ($n$ = 2), and the aforementioned Irish teachers currently using Attention Autism, in their respective classrooms, completed the questionnaire ($n$ = 21).

**3.12.7 Implementation fidelity**. Implementation fidelity was measured to identify the degree to which the current intervention was implemented as it was designed. The researcher observed three sessions of Attention Autism over the six week period in each intervention group setting. Implementation fidelity was calculated using an observer-rated fidelity checklist composed by the researcher. The contents of the checklist are based on the administration guidelines provided by MCA during Attention Autism CPD. This checklist consists of 14 items, see Appendix L for further details of the items on this checklist. Teachers received a score of one for every item they implemented correctly on the checklist. The total number of correctly implemented items was calculated for each teacher across the three observed sessions, and the number of correctly implemented items out of 14 was documented. Item scores were summed and divided by the total number of items (14) and multiplied by 100 to obtain a total percentage score for fidelity for each session. A mean fidelity score across classrooms was then computed. An overview of the methods used to calculate implementation fidelity is provided in Figure 8. Teachers' fidelity to Attention Autism intervention was 88% over the six weeks.

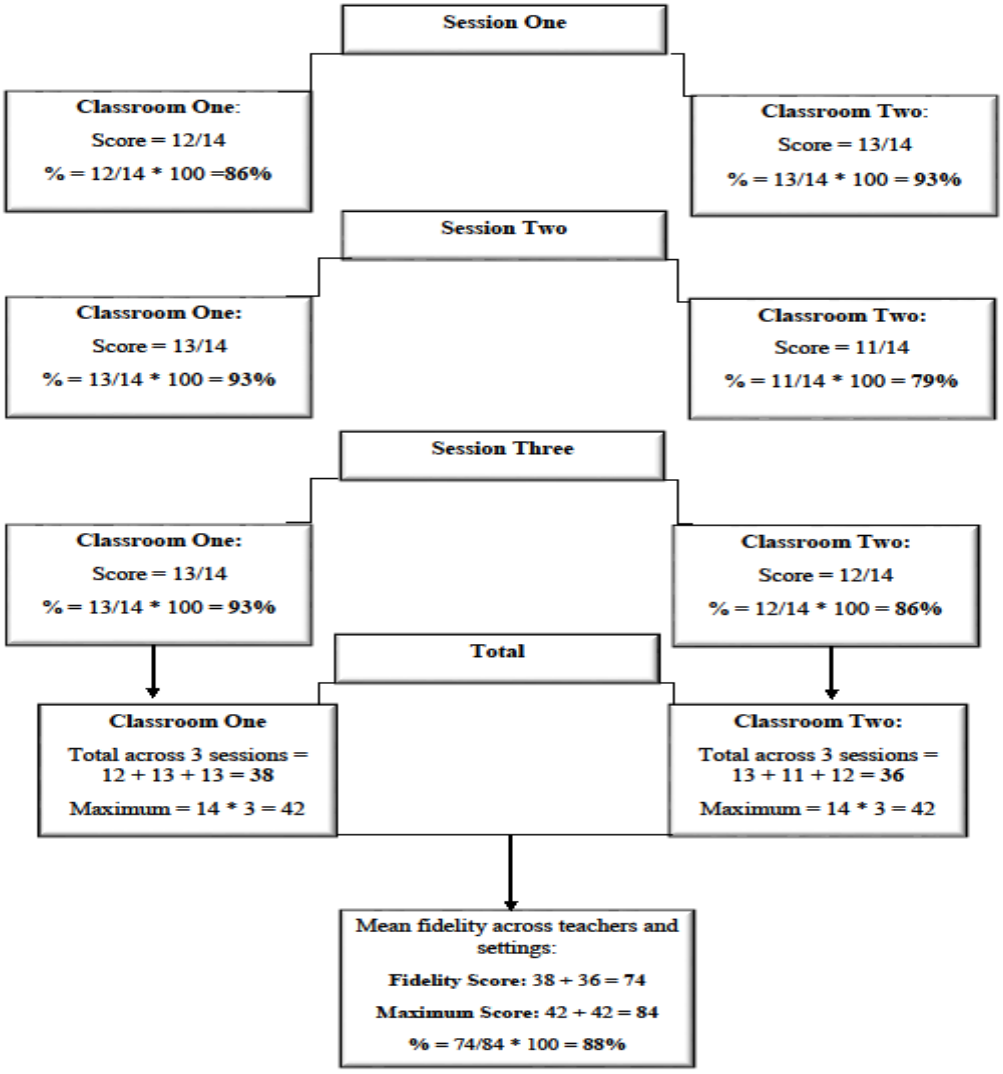



*Figure 8.* Measurement of Implementation Fidelity

### 3.13 Ethics

The present study was approved by the Mary Immaculate Research Ethics Committee (MIREC) in June 2019. Receipt of Ethical Approval is presented in Appendix M. Prior to commencing this study, the researcher identified the need to consider the ethics of working with a vulnerable population, and the protection of their rights. The researcher adopted the five core principles as outlined by Trinity College Research Centre

(TCRC) for working with children with disabilities: Beneficence, Non-Maleficence, Autonomy, Fidelity, and Inclusivity (Whyte, 2005).

**3.13.1 Beneficence and non-maleficence.** The researcher aimed to protect the well-being of all participants and to ensure that no harm was caused. The research project collected data regarding autistic children of seven years and younger. This cohort are a vulnerable population and the researcher put a number of measures in place to protect the children from potential harm. All data collected in relation to the children in the study such as personal information regarding learning ability and video data was stored on a password protected external hard drive which did not leave the researcher's home office. Robson (2011), highlights that the researcher may not be the sole owner of the video data collected. Research participants such as the parents and recorded children have a right to the data also. All parents were therefore given the option to request their child's data. In order to respect the privacy and confidentiality of all participants, the names of the participants and the names of the schools in which the study took place, are not included in the thesis.

The researcher liaised with the class teacher regarding timetabling and ensured that the presence of the researcher was minimally disruptive to the children's daily routine. Furthermore, prior to data collection, procedures were agreed upon with the class teachers in the event of a child becoming upset during assessment and/or observation. If a child became upset during the observation process and the teacher and/or researcher deemed it unfair for recording to continue, the observation session was terminated.

**3.13.2 Autonomy and fidelity.** The researcher was acutely aware of the power dynamic of age which can exist in research projects and ensured that children had a right to withdraw from participation, independent of their parents or teachers. The British Educational Research Association (BERA) (2018) guidelines suggest that informed child assent should be sought prior to the beginning of the research. Flewitt (2006) suggests that assent should be conceived as a continuous process and considered provisional, by the researcher. This concept of provisional assent was adopted within the current research project. Children were asked at the start of each visit whether they were willing to participate.

**3.13.3 Inclusivity.** The children participating in this research were pre-verbal and had limited receptive language. In order to ensure that they were adequately prepared for the research project, and to support the equal participation of all children, the researcher supplied their class teachers with a photograph of the researcher for their visual timetable and a social story.

# Results

## 3.14 Preliminary Analyses

This study used a quasi-experimental design using group comparison between intervention and control across two time points. Statistical analyses were performed using Statistical Packages for the Social Sciences (SPSS) Version 26.0 (International Business Machines Corporation, 2019). Tests of normality were carried out to examine the distribution of the data for each of the dependent variables, and to guide subsequent analysis. Mixed between-within subjects' analysis of variance (ANOVA) was primarily used to identify differences between the intervention and control group from pre- to post-intervention. This type of data analysis is considered reasonably robust to violations of normality (Pallant, 2013). However, if further analysis was needed to investigate group differences, paired samples t-tests were conducted for normally distributed variables, and Wilcoxon signed-rank tests were used for variables with Shapiro-Wilk p values <0.05. All results were reported as significant at the alpha level .05 ($p < .05$)

**3.14.1 Comparability of groups at entry.** As presented in Table 13, there were no significant group differences on the following demographic variables: chronological age, gender, and ethnicity, at study entry. No group differences were found for IJA, RJA, and percentage of time children spent in an unengaged and supported joint engagement state, at study entry. However, a Mann Whitney U test revealed significant differences in the percentage of time spent in a co-ordinated joint engagement state between the intervention group ($Md = 8.50$, $n = 10$), and the control group ($Md = .00$, $n = 10$) ($U = 17.50$, $z = –2.43$, $p = .02$).

Table 13

*Child Characteristics of Groups Pre-Intervention*

| | Intervention ($n$ =10) | | Control ($n$ =10) | | p-value |
|---|---|---|---|---|---|
| **Demographics** | | | | | |
| Gender (males/females) | 9/1 | | 7/3 | | |
| Ethnicity (Irish/other) | 9/1 | | 8/2 | | |
| Chronological age (years) | $M$ = 5.10 | $SD$ = 1.52 | $M$ = 5.50 | $SD$ = .97 | .49 |
| **Variables under investigation** | *Md* | | *Md* | | |
| **ESCS** | | | | | |
| Initiation of joint attention | 4.50 | | 4.50 | | .85 |
| Response to joint attention | 5.10 | | 4.20 | | .52 |
| **Class observations** | | | | | |
| Initiating joint attention | .00 | | .50 | | .28 |
| Responding to joint attention | .50 | | .00 | | .10 |
| % Unengaged | 32.00 | | 49.11 | | .07 |
| % Supported JE | 53.50 | | 37.00 | | .31 |
| % Coordinated JE | 8.50 | | .00 | | .02 |

### 3.15 Initiation of Joint Attention and Response to Joint Attention Behaviours

Mixed between-within subjects' ANOVA's were conducted to identify whether there was a difference in the frequency of IJA and RJA behaviours between the intervention and control group, over time, during the ESCS. Children's joint attention outcomes across both the ESCS and classroom observations are presented in Table 14.

Table 14

*Outcome Measures for Joint Attention*

| | Intervention *n* = 10 | | | Control *n* = 10 | | |
|---|---|---|---|---|---|---|
| **ESCS** | Pre | Post | p | Pre | Post | p |
| IJA | 4.50 | 10.50 | .03 | 4.50 | 5.00 | .08 |
| RJA | 5.10 | 6.70 | .02 | 4.20 | 4.80 | .39 |
| **Observations (CT)** | | | | | | |
| IJA | .00 | 2.00 | .01 | .50 | .00 | .16 |
| RJA | .50 | 3.00 | .02 | .00 | .50 | .04 |
| **Observations (AA)** | | | | | | |
| IJA | 2.50 | 4.20 | .06 | | | |
| RJA | .50 | 1.00 | .73 | | | |

**3.15.1 Initiation of joint attention (ESCS).** Results found no interaction effect for time and group ($F(1, 18) = 2.48$, $p = .13$), and no significant main effect between groups ($F(1,18) = 0.00$, $p = .98$); signifying that there was no statistically significant difference between the experimental and control groups in terms of IJA. However, results show a main effect between time one and time two ($F(1,18) = 8.63$, $p = .009$, $\eta^2 = .32$). Post-hoc analysis showed a significant difference between time one and time two for IJA within the intervention group ($z = -2.14$, $p = .03$) with an increase from time one ($Md = 4.50$) to time two ($Md = 10.50$). There was no significant difference for the control group ($z = -1.73$, $p = .08$) from time one ($Md = 4.50$) to time two ($Md = 5.00$).

**3.15.2 Response to joint attention (ESCS).** Overall, results found no interaction effect for time and group ($F(1, 18) = 1.27$, p = .27), and no significant main effect between groups ($F(1, 18) = 1.81$, p = .29). However, results indicate a main effect between time one and time two ($F(1, 18) = 6.15$, p = .02, $\eta^2 = .38$). Follow-up analysis found that there was a significant difference between time one and time two for RJA within the intervention group ($t(9) = -2.75$, $p = .02$) with an increase from time one (M = 5.10, SD = 3.18) to time two (M = 6.70, SD = 2.98). There was no significant difference for the control group ($t$ (9) = -.89, p = .39) from time one ($M = 4.20$, $SD = 2.70$) to time two ($M = 4.80$, $SD = 3.29$).

**3.15.3 Frequency of IJA behaviours during circle time.** A mixed between-within subjects' ANOVA was conducted to identify whether there was a difference in the frequency of IJA behaviours used during circle time between the intervention and control group, over time. The results showed there was no interaction effect for time and group ($F(1, 18) = .71$, $p = .41$), and no significant main effect between groups ($F(1, 18) = .28$, $p = .64$). However, results show a main effect between time one and time two ($F(1, 18) = 8.41$, $p = .01$, $\eta^2 = .31$). Post-hoc analysis showed that there was a significant difference between time one and time two for frequency of IJA during circle time within the intervention group ($z = -2.53$, $p = .01$) with an increase from time one ($Md = .00$) to time two ($Md = 2.00$). There was no significant difference for the control group ($z = -1.41$, $p = .16$) from time one ($Md = .50$) to time two ($Md = .00$).

**3.15.4 Frequency of RJA behaviours during circle time.** A mixed factorial ANOVA was also carried out to identify whether there was a difference in the frequency of RJA behaviours used during circle time between the intervention and control group over time. The results showed there was no interaction effect for time and group ($F(1, 18) = 2.79$, $p = .11$). However, results show a main effect between time one and time two ($F(1, 18) = 13.89$, $p = .002$, $\eta^2 = .43$) and a significant main effect between intervention and control groups ($F(1, 18) = 20.16$, $p < .001$, $\eta^2 = .53$). Specifically results showed an increase from time one to time two for both the intervention group ($z = -2.31$, $p = .02$) ($T_1$: $Md = .50$, T2: $Md = 3.00$) and the control group ($z = -2.06$, $p = .04$) ($T_1$: $Md = .00$, $T_2$: $Md = .50$). This indicates that children in both the intervention and control group increased their frequency of RJA during circle time from pre to post-intervention.

**3.15.5 Frequency of IJA and RJA during Attention Autism.** A paired samples t-test was utilised to identify whether there was a difference in the frequency of IJA behaviours used during the Attention Autism group for the intervention group pre- and post-intervention. Statistically, no significant difference for IJA ($t(9) = -2.12$, $p = .06$) were found. A Wilcoxon signed-rank test was conducted to identify whether there was a difference in the frequency of RJA behaviours used during Attention Autism group pre- and post-intervention. Similarly, no significant difference for RJA ($z = -.35$, $p = .73$) were found. However, the descriptive statistics show that, on average, there is an increase from time one to time two for IJA ($T_1$ $M = 2.50$, $SD = 2.12$, $T_2$, $M = 4.20$, $SD = 3.26$) and RJA ($T_1$, $Md = .50$, $T_2$, $Md = 1.00$).

### 3.16 Engagement States during Attention Autism

Paired samples t-tests were utilised to identify whether there was a difference in the percentage of time spent in an unengaged, supported, and coordinated engagement states during Attention Autism for the intervention group. Joint engagement outcomes for participating children are outlined in Table 15.

**3.16.1 Unengaged.** Results found that there was a significant decrease in the percentage of time children spent in an unengaged state from pre- to post-intervention ($t(9) = 3.70$, $p = .005$) ($T_1$ $M = 19.50$, $SD = 11.19$, $T_2$, $M = 6.08$, $SD = 7.30$).

**3.16.2 Supported joint engagement.** No significant effects were found in the percentage of time children spent in a supported joint engagement state from pre to post-intervention ($t(9) = .49$, $p = .63$) ($T_1$: $M = 73.40$, $SD = 14.13$, $T_2$: $M = 69.00$, $SD = 18.92$).

**3.16.3 Coordinated joint engagement.** Results found a significant increase in the percentage of time children spent in a coordinated joint engagement state from pre- to post-intervention in the Attention Autism group ($t(9) = -2.46$, $p = .04$) ($T_1$: $M = 4.20$, $SD = 4.29$, $T_2$: $M = 15.90$, $SD = 16.13$).

### 3.17 Engagement States during Circle Time

Mixed between-within subject' repeated measures ANOVAs were conducted to identify whether there was a difference in the percentage of time children spent in an unengaged, supported, and coordinated engagement state during circle time between the intervention and control group over time. Joint engagement outcomes for participating children during circle time are also outlined in Table 15.

**3.17.1 Unengaged.** The results showed there was no interaction effect for time and group ($F(1, 18) = .91$, $p = .35$), and no significant main effect between time one and time two ($F(1,18) = .60$, $p = .45$). However, results show a significant main effect between groups ($F(1, 18) = 8.83$, $p = .009$, $\eta^2 = .34$). Statistically, no significant differences in the percentage of time children spent in an unengaged state were found for the intervention group ($t(9) = 1.02$, $p = .33$) or the control group ($t(9) = -.19$, $p = .85$). However, the descriptive statistics show that on average the time spent in an unengaged state during circle time decreased from pre to post for the intervention group ($T_1$: $M = 32.00$, $SD =$

20.50, $T_{2:}$ *M* = 24.50, *SD* = 22.37), but not for the control group ($T_{1:}$ *M* = 49.11, *SD* = 12.61, $T_2$: *M* = 49.89, *SD* = 14.57).

**3.17.2 Supported joint engagement.** The results showed there was no interaction effect for time and group ($F(1, 18) = .49$, p = .49), no significant main effect between time one and time two ($F(1,18) = .1.33$, p = .27), and no significant main effect between groups ($F(1, 18) = 3.96$, p = .06).

**3.17.3 Coordinated joint engagement.** Analysis found no interaction effect for time and group ($F(1, 18) = .58$, $p = .46$), and no main effect between time one and time two ($F(1, 18) = 3.98$, $p = .06$). A significant main effect between groups was found ($F(1, 18) = 6.71$, $p = .02$, $\eta^2 = .28$). Statistically, no significant difference for percentage of time spent in a coordinated joint engagement state were found for the intervention group ($z = -1.13$, $p = .26$) or the control group ($z = -1.83$, $p = .07$). However, the descriptive statistics show that on average there is an increase in time spent in coordinated joint engagement from time one to time two, for the intervention group ($T_1$ *Md* = 8.50, $T_2$, *Md* = 9.00), but not for the control group ($T_{1,}$ *Md* = .00, $T_2$, *Md* = .00).

Table 15

*Outcome Measures- Joint Engagement*

| | Intervention *n* = 10 | | | Control *n* = 10 | | |
|---|---|---|---|---|---|---|
| **Observations (CT)** | Pre | Post | p | Pre | Post | p |
| Unengaged | 32.00 | 24.50 | .33 | 49.11 | 49.89 | .85 |
| Supported JE | 53.50 | 48.00 | .36 | 37.00 | 21.00 | .11 |
| Coordinated JE | 8.50 | 9.00 | .26 | .00 | .00 | .07 |
| **Observations (AA)** | | | | | | |
| Unengaged | 19.50 | 6.08 | .005 | | | |
| Supported JE | 73.40 | 69.00 | .63 | | | |
| Coordinated JE | 4.20 | 15.90 | .04 | | | |

### 3.18 Sensitivity Analysis

Further sensitivity analyses were conducted to examine potential variance across age for IJA, RJA, and coordinated joint engagement states. Descriptive statistics were conducted for each of these variables for pre and post across ages three to seven for the intervention group. According to means, all children made gains in the variables measured, irrespective of age. See Table 16 for an outline of these results.

Table 16

*Pre and Post-Intervention Results of Intervention Group*

| | IJA | | RJA | | Coordinated JE (CT) | | Coordinated JE (AA) | |
|---|---|---|---|---|---|---|---|---|
| Ages | Pre *M* *(SD)* | Post *M* *(SD)* | Pre *M* *(SD)* | Post *M* *(SD)* | Pre *M* *(SD)* | Post *M* *(SD)* | Pre *M* *(SD)* | Post *M* *(SD)* |
| 3 years (*n* = 2) | 3.00 (2.83) | 12.50 (4.95) | 1.00 (.00) | 4.50 (.71) | 4.50 (6.36) | 10.00 (14.14) | 1.50 (2.12) | 22.00 (2.86) |
| 4 years (*n* = 2) | 2.00 (1.41) | 15.00 (4.24) | 4.00 (1.41) | 6.00 (1.41) | 11.50 (2.12) | 7.00 (4.24) | 6.00 (8.49) | 15.00 (21.21) |
| 5 years (*n* = 1) | 12.00 | 4.00 | 5.00 | 7.00 | 3.00 | 6.00 | 8.00 | 8.00 |
| 6 years (*n* = 3) | 7.67 (4.04) | 10.67 (4.51) | 8.33 (2.89) | 9.33 (1.16) | 7.00 (6.56) | 28.33 (24.83) | 6.33 (1.53) | 25.00 (22.91) |
| 7 years (*n* = 2) | 6.00 (4.24) | 9.50 (.70) | 5.50 (2.12) | 7.50 (3.54) | 5.00 (7.07) | 14.00 (16.97) | .00 (.000) | 1.00 (1.41) |

### 3.19 Social Validity

Teachers currently using Attention Autism in their practice (*n* =23), in the ASD class setting, completed a researcher designed social validity questionnaire. Teachers

rated statements regarding their perception of Attention Autisms feasibility for the ASD classroom on a five-point Likert scale from strongly disagree to strongly agree. Responses on the social validity measure were analysed descriptively. Teacher demographics and item responses are summarised in Table 17.

Table 17

*Social Validity Outcomes*

| **Demographics** | *M* | *SD* |
|---|---|---|
| Teaching Experience (years) | 10.09 | 5.82 |
| Years in ASD setting | 3.80 | 2.49 |
| Length of time using AA (months) | 22.65 | 18.95 |
| **Social Validity** | *M* | *SD* |
| Ease of Implementation | 4.17 | .88 |
| Class Enjoyment | 4.78 | .42 |
| Cost Effectiveness | 3.35 | .94 |
| Recommend to colleagues | 4.78 | .42 |
| Confidence in use | 4.22 | .79 |
| Appropriateness | 4.87 | .34 |
| Usefulness | 4.78 | .60 |
| Effectiveness | 4.78 | .60 |
| Probability of continued use | 4.70 | .64 |

Note. 1= Strongly Disagree; 2= Disagree; 3 = Undecided; 4 = Agree; 5= Strongly Agree

## Discussion

The current study examined the effectiveness of the Attention Autism intervention on the joint attention and joint engagement, of autistic children in Ireland. This small scale study yielded a number of positive results. Firstly, although children were similar in their social-communication and language skills prior to beginning intervention, significant effects were noted for children receiving six weeks of Attention Autism intervention, in their classroom. As reported by parents, no additional interventions were initiated during the course of this study. Thus, the data displays effects of a targeted intervention model, in addition to the regular school hours received by children.

### 3.20 Research Question One: How Effective is Attention Autism at Improving the Joint Attention Behaviours of Autistic Children?

Children who received the Attention Autism intervention demonstrated significant increases in their initiations of joint attention, and response to joint attention behaviours during the ESCS, over children in the control group. This finding suggests that children were able to generalise their newly learnt joint attention skills from the Attention Autism group to a structured assessment setting. This is a promising result as previous research reports short-term targeted interventions often do not yield significant changes in standardised tests (Chang et al., 2016). The current findings accord with results from studies, in which the interventionist was a trained specialist (Kasari et al., 2006). Existing school-based joint attention intervention studies, in which the teacher has been the primary interventionist have found non-significant results on the ESCS (Chang et al., 2016; Kaale et al., 2012; Lawton & Kasari, 2012). It has been suggested that notable improvements of joint attention skills in a structured assessment setting with an unfamiliar person, require a trained specialist as an interventionist or a longer intervention duration (Kaale et al., 2012). The interventionists in the current study were children's class teachers, and the intervention duration was six weeks. Therefore, the results of the current study conflict with the previous argument, and display promising evidence for teacher implemented short-term joint attention interventions.

Children in the intervention group displayed significantly more spontaneous IJA behaviours during circle time from pre to post-intervention than the control group. Similarly, Chang et al. (2016) found that children who received JASPER intervention

displayed significant increases in their IJA behaviours. This school-based study is the first which examined children's use of IJA behaviours in naturalistic teacher led groups. Preceding studies have investigated the difference in the use of IJA during teacher-child play interactions (Chang et al., 2016; Goods et al., 2013; Kaale et al., 2012; Lawton & Kasari, 2012). However, research studies to date have neglected to examine the influence of intervention on children's use of joint attention behaviours in teacher led groups. Small group instruction is a common methodology employed in the ASD class setting in Ireland (Daly et al., 2016). Therefore, it is both important and relevant to explore how we can increase IJA skills in this context. This finding is valuable as it suggests that short-term intervention can increase children's ability to utilise spontaneous IJA in a group setting with their peers and teacher.

Similarly, children in the intervention group displayed significant increases in their RJA skills from pre- to post-intervention, during circle time. This is the first school-based joint attention study which has also measured RJA outcomes. Literature relating to the forms of joint attention indicates that autistic children may present with more IJA behaviours than RJA behaviours. This is explained by the differing functions that joint attention behaviours may serve (Charman, 2003). IJA behaviours can have either an imperative (requesting) or a declarative (commenting) function, with impairments in the latter presenting most severely. The ability to respond to the joint attention bids of another relies on social motivation to share interest with a social partner. Interestingly, both the intervention group and the control group demonstrated significant increases in their RJA behaviours during circle time. As a result, the gains made by the intervention group may not be attributed to their engagement with the Attention Autism intervention. Instead, gains made by both groups may be better explained by maturation. An alternative explanation may endorse research suggesting that the social partner is an important component of joint attention interactions. Chang et al. (2016) found that children displayed greater social-communication skills with their teachers than unfamiliar testers. Autistic children often rely on routine and structure to support them with their learning, and ability to cope with new stimuli (Jordan, 2005). At the time of post-intervention data collection, children were attending school for at least four months and were therefore familiar with the routine of circle time, and their teacher. Perhaps this offers an

explanation for the increase in RJA behaviours across groups from pre to post-intervention.

Finally, the intervention group displayed an increase in their use of IJA and RJA behaviours pre- to post-intervention, albeit not statistically significant, during the Attention Autism group. Children in the intervention group demonstrated a significant increase in their use of IJA and RJA behaviours during circle time. However, on average children used more IJA and RJA behaviours during Attention Autism, than circle time at baseline. This may suggest that engagement in an Attention Autism group naturally elicits more IJA and RJA behaviours than other teacher led groups. The intervention group had eighteen sessions of Attention Autism, in comparison to daily circle time groups, perhaps a longer intervention period may have resulted in significant increases during the Attention Autism group also.

### 3.21 Research Question Two: How Effective is Attention Autism at Improving Joint Engagement of Autistic Children?

At pre-intervention, significant differences between the intervention and control group were noted, with the intervention group demonstrating greater coordinated joint engagement with their teacher. A possible explanation may be that the intervention teachers are incorporating strategies learnt from the Attention Autism intervention model into their practice, across the curriculum. This study measured engagement levels of children from pre to post, during teacher led groups. No statistically significant differences were found pre to post for the intervention or control group. Of note, the intervention group demonstrated a decrease in the percentage of time they spent in an unengaged state pre-intervention to post-intervention and an increase in the percentage of time they spent in a coordinated joint engagement state during circle-time. In contrast, the control group remained stable over time. Although a positive trend for the intervention group is noted, the results were not statistically significant. However, this may be due to the small sample size and potential loss of power, rather than the efficacy of the intervention. However, it is noteworthy that a significant difference existed in relation to coordinated joint engagement at baseline, with the intervention group engaging in more coordinated joint engagement with their teacher than the control group. The positive trends may, therefore, have been influenced by the pre-existing joint engagement skills

possessed by children in the intervention group prior to the intervention period. Children in the intervention group displayed a significant decrease in disengagement and a significant increase in coordinated joint engagement during the Attention Autism group. Attention Autism uses visual stimulating and motivating objects to encourage spontaneous communication and shared attention. This may have served as a more motivating environment and context for engagement than circle time which focuses more on academic skills, and less on individualised child interest.

### 3.22 Implementation Fidelity and Social Validity

Similar to previous research, teachers were found to adhere to the fidelity of intervention administration throughout the intervention (Chang et al., 2016; Lawton & Kasari, 2012). However, teachers implementing JASPER in the school environment were offered substantial researcher support such as on-site weekly coaching sessions (Chang et al., 2016; Lawton & Kasari, 2012). The teachers within the current classrooms implemented the intervention without this level of on-site support and adhered to the fidelity and integrity of the intervention. This is an encouraging result as it potentially reveals the ease of implementing Attention Autism with fidelity, without the need for external support. This is particularly important for the current context, as present waitlists do not allow external personnel to readily support school staff with intervention.

Twenty-three teachers rated Attention Autism in terms of effectiveness, usefulness, appropriateness for the ASD class setting, cost effectiveness, willingness to recommend to colleagues, and children's enjoyment. Teachers rated Attention Autism positively in all areas. Attention Autism relies on the use of visually motivating stimuli, as a result, teachers are required to update their materials regularly. Of note, Attention Autism gained the lowest rating for cost effectiveness, which may act as a potential barrier in some educational settings. Chang et al. (2016) found a reduction in teachers' implementation of JASPER strategies at one month follow-up. This may indicate that the JASPER intervention requires the support of external personnel to support sustained implementation by school staff. On the other hand,teachers completing the social validity measure, on average, reported implementing Attention Autism for more than one academic year. This suggests that Attention Autism is a suitable joint attention intervention for the ASD classroom, which teachers can implement sustainably, and with

fidelity in the naturalistic class setting. Typically developing children learn to use joint attention between two and nine months, before transitioning to learning from joint attention in the second year of development (Mundy, 2016). These skills do not develop at the same rate for autistic children, resulting in a more effortful process of engaging in and learning from joint attention for this cohort. Furthermore, there is variance in the abilities of autistic children to engage in and maintain joint attention (Mundy, 2016). This may be exemplified in the current study as children in the intervention group developed their skills in the first three stages of Attention Autism, but did not exhibit a readiness to transition to the fourth and final stage. This indicates that an intervention period of more than six weeks is likely warranted in order to ensure children engage with all stages of this intervention. It is therefore particularly important that interventions targeting these needs are sustainable in the classroom to allow for sufficient time for all children to develop their skills in this area.

### 3.23 Outcomes and Age

Descriptive statistics found that school-age children in the intervention group made gains from pre to post in the joint attention and engagement outcome variables measured. Recently, researchers have highlighted the neglect of older children from the joint attention intervention literature (Bean & Eigsti, 2012). Furthermore, given the pervasive and lifelong implications of poor joint attention, researchers are beginning to advocate for joint attention interventions to be utilised with children during the preschool period, and beyond. On average the teachers in this study reported using Attention Autism with autistic children aged five to eight, and rating it highly. Thus, providing promising evidence for the impact short-term joint attention intervention can have on the joint attention abilities of school-aged children, as well as preschool children. Furthermore, it demonstrates the potential usability of the Attention Autism intervention with school-age children.

### 3.24 Strengths and Limitations

This study possesses clear strengths. At the time of writing, this is the first quasi-experimental study examining a school-based joint attention intervention, in the Irish context. It is also the first study to evaluate the Attention Autism intervention with an Irish sample. A considerable strength of this study lies in the selection of intervention

setting, and interventionist. The decision-making was informed by the existing research to practice gap in this area (Guldberg et al., 2017). In order to contribute relevant and valuable research that contributes knowledge to the field and relevant valuable information to schools, the research was set in naturalistic classrooms, with class teachers acting as interventionists (Locke et al., 2019). Social validity measures have been inconsistently used in school-based joint attention research to date. The inclusion of social validity measures in the current study overcame these pre-existing limitations. Additionally, the researcher has no affiliations with Attention Autism and was not seeking to validate its efficacy. As a result, the current study objectively evaluated the intervention model in the absence of researcher bias.

Although this study found positive effects on child outcomes, high levels of teacher fidelity, and social validity, there remain limitations. The results of the current study rely on a small sample size, which potentially limits the external generalisability of the findings. In addition to the small sample size, purposive sampling procedures were employed, further impacting generalisability. Results in relation to joint engagement indicated positive trends but did not reach significance for the intervention group pre- to post-intervention. This could potentially be explained by a loss of power due to the small sample size. Further highlighting the need for a larger sample size in future research. Participating teachers volunteered to engage in the research process, which may indicate bias, or particular interest in the intervention. Mertens (2014) highlights the strength of experimental treatment as a variable which can impact validity. The majority of school-based research in the area of joint attention has involved the implementation of short-term interventions and neglected to include follow-up procedures in their methodology (Goods et al., 2013; Kaale et al., 2012; Lawton & Kasari, 2012). With regard to the current study, time constraints of the researcher, led to similar limitations, the intervention was brief, and no follow-up was conducted. Inclusion of follow-up procedures would have allowed for richer exploration regarding the long-term implications of the intervention, in addition to the implementation fidelity of teachers, over time.

### 3.25 Conclusion

The current study found promising evidence for the effectiveness of Attention Autism on the joint attention, and joint engagement of autistic children. As outlined, the

number of joint attention studies conducted in the school setting are few in comparison to those conducted in laboratory settings by researchers. Further, there is a dearth of research on the efficacy of Attention Autism as an intervention. Given the positive child outcomes, and encouraging social validity scores, further evaluation of Attention Autism in the current setting is warranted. The positive results indicate potential for targeting joint attention in the ASD class setting in Ireland, this has key implications for national policy and practice. These implications will be outlined in detail in the Critical Review section of this thesis.

## Part Three: Critical Review

This section of the thesis will allow the researcher to critically appraise the research conducted. First, the methodological decision-making is discussed, referencing both the strengths and limitations of the study design and measures used. Second, unanticipated ethical dilemmas faced by the researcher over the course of the study are outlined. Third, the potential implications of the current research findings to knowledge, practice, and policy are delineated. Fourth, in light of the current study's findings and limitations, avenues for future research are addressed. Fifth, a researcher reflection regarding the strengths, limitations, and possible theoretical basis for Attention Autism are described. Finally, this section concludes with an impact statement, in which the researcher explicitly defines the unique contribution this research makes to the field of educational and child psychology.

### 4.1 Epistemology and Ontology

The formulation of research questions and subsequent methodological choices were informed by previous literature. However, a further factor that influenced the methodological decision-making was the ontological viewpoint of the researcher (Cohen, Manion, & Morrison, 2007). The researcher subscribes to the belief that one reality exists, and is discoverable, though with the inevitable imperfections that stem from human limitations (Mertens, 2014). The present study is therefore situated within a post-positivist paradigm. A post-positivist approach to scientific inquiry is predominantly quantitative, and experimental in nature. Therefore, this study adopted quantitative methods within a quasi-experimental design. In terms of epistemology, the post-positivist paradigm acknowledges that theory and previous knowledge can impact the observations of the researcher. Therefore, emphasising the importance of objectivity when conducting research (Mertens, 2014). This research study focused on evaluating the empirical evidence available in relation to joint attention in the Irish context and did not seek to validate one approach over another (NCSE, 2015). This aim of the current study was to explore the effectiveness of Attention Autism on joint attention and joint engagement outcomes in the school setting, due to the overwhelming evidence that research in this area was needed at a national level. The researcher did not possess previous experience or opinions of the intervention. Attention Autism is an intervention currently being used

in Irish classrooms and was chosen based on its relevance to autistic children within the current context. Thus, indicating no preconceived biases towards the intervention, and allowing the researcher to remain neutral. Therefore, the purpose of the inquiry was child-based, and not approach based.

## 4.2 Methodological Considerations

An overview of the strengths and limitations of the current study's design was provided in the discussion section of part two of this thesis. The following section will expand on the methodological decision-making of the researcher, and the impact of these decisions on the study's methodological quality in comparison to preceding studies.

**4.2.1 Design.** School-based joint attention research to date primarily employed Randomised Control Trials (RCT) (Boyd et al., 2018; Chang et al., 2016; Kaale et al., 2012; Lawton & Kasari, 2012). In contrast, action research was the main research methodology used when examining the efficacy of Attention Autism. RCTs are considered the gold standard of intervention research design. However, their shortcomings have been acknowledged as compromising generalisability and external validity, as they neglect the naturalistic setting (Dunsmuir, Brown, Iyadurai, & Monsen, 2009). With regard to this study and its aims, the use of an RCT design would have served to further contribute to the pre-existing research to practice gap in this area. With respect to this research, it would not have been ethical to assign children to classrooms they were not accustomed to. The present study is therefore an example of how an RCT design may not always be feasible or ethical in the context of educational research (Dunsmuir et al., 2009).The choice of a quasi-experimental design maintained the rigour of experimental design methods while also contributing positively to the ecological validity of the study. External validity is defined as the degree to which the findings of a study can be generalised to the wider population, cases, or situations (Cohen, Manion, & Morrison, 2007; Mertens, 2014). Ecological validity is a form of external validity concerned with the extent to which study outcomes are meaningful and generalisable to real-life environments external to the study (Andrade, 2018; Ledford, Hall, & Conder, 2015; Mertens, 2014). This study is implemented in the participating children's typical school environment, with their regular teacher as interventionist. This substantially enhances the

ecological validity of the study. Therefore, a considerable strength lies in this study's research design.

Although limited, existing research studies evaluating Attention Autism report positive effects (Buckingham, 2012; Courtman, 2018). However, neither of the studies employed a control group. This questions whether the reported positive effects are best explained by response to intervention or extraneous variables such as maturation (Mertens, 2014). As mentioned previously, the design of the current study enhanced its ecological validity. However, a longstanding tension between external and internal validity exists. According to Mertens, (2014), in order for a study to attain high external validity, the research should be conducted in the real-world setting. Conversely, the laboratory is the recommended setting to complete research if it is to attain high internal validity (Merten, 2014). Internal validity is concerned with determining whether observed changes in the dependent variable are due to the effect of the independent variable or an unintended variable (Mertens, 2014). The setting of this research does impact on the internal validity of the study due to the complexity of real-life settings. To the author's knowledge this is the first study, evaluating Attention Autism that included a control group. At the time of pre-data collection, children had returned to school for a period of six weeks, following their summer break. Autistic children can find transition difficult to manage, and thus settling into new routines can present many challenges (Jordan, 2005). The inclusion of a control group in this study consequently enhanced the internal validity of the study, by controlling for possible maturational changes following this transitionary period.

**4.2.2 Measures.** Reliability assesses the degree to which research findings can be replicated (Mertens, 2014). The majority of studies evaluating Attention Autism used teacher observation and/or checklists to measure children's joint attention outcomes pre- and post-intervention. However, the data collection methods used were not described in sufficient detail to allow replication, and the reliability of these measures were not reported. In order to enhance the reliability and validity of measures used in this study, the researcher adopted more robust measures used in previous school-based joint attention research. The first measure chosen was the Early Social Communication Scales (ESCS), which is considered a gold standard social-communication assessment tool with

autistic and developmentally delayed children (Mundy et al., 2003). This has attained good reliability and validity scores (Mundy et al., 1994; Mundy, 1995).

The use of observational methodology within research has been criticised for its subjectivity (Mertens, 2014). To mitigate this criticism, the researcher elected to code the classroom observation video data according to an engagement state coding protocol outlined by Adamson et al. (2004). This defined the engagement states for the researcher and allowed for more consistent, and reliable observation. This measure has been used extensively in this area of research and has reported good reliability and validity (Adamson, Bakeman, & Deckner, 2004; Wong and Kasari, 2012). When using video coding, Mertens (2014) recommends researchers report the reliability of observational data by having an independent observer observe a percentage of their video data. A percentage score is then calculated based on the number of agreements and disagreements per observation and reported as inter-rater reliability. In this study, a peer on the doctorate programme independently and blindly coded 20% of the observational data. Good inter-rater reliability was observed, which further strengthens the validity of this study's findings.

Preceding research evaluating the Joint Attention Symbolic Play Engagement Regulation (JASPER) intervention (Kasari et al., 2006, Kasari et al., 2008) has used teacher-child play observations to measure joint engagement pre- and post-intervention. However, the JASPER intervention uses one-to-one play interactions to teach joint attention skills to children (Kasari et al., 2006). Attention Autism focuses on fostering joint attention and spontaneous communication in a small group setting but does not directly target play skills. In Ireland, due to limited resources, and the differing age, ability, and individual needs of children in ASD class settings, a common methodology used is small group teaching. School-based research has found that autistic children spend limited time on task (Sparapani et al., 2016) and more time in an unengaged state than children in a mixed disability group in the classroom setting (Wong & Kasari, 2012). Therefore, identifying if intervention can promote joint engagement during teacher led groups was considered important and relevant to investigate in the current context. This was the researcher's rationale for conducting observations during teacher led groups, in the current study.

## 4.3 Limitations of the Current Study

The time allocated to research within the Doctorate programme, and the brief timeline for completion, was in itself a limitation. The limitations and time constraints dictated by the nature of this programme are considered somewhat accountable for the small sample size recruited, brief intervention period, and the inability to collect follow-up data.

**4.3.1 Voice of the child.** This research aimed to investigate both the effectiveness and clinical utility of the Attention Autism intervention (APA, 2006). There is an extensive body of intervention research conducted with autistic children in the field of education and psychology. A particular strength of this study lies in the researcher's use of a social validity measure. However, although pertinent information was gained from teachers, the study neglected to gain the perspectives of the participating children. Research has indicated the importance of school-based social validation measures including both teachers and children (Conroy et al., 2008). Article 12 of the United Nations (UN) Convention on the Rights of the Child (1989) declares that it is the right of the child to have their views in relation to decision-making that affects them taken into account and respected (UN, 1989). At a national level, the Irish Government has demonstrated its commitment to children's rights in Better Outcomes, Brighter Futures: The National Policy Framework for Children and Young People 2014-2020 (Department of Children and Youth Affairs (DCYA), 2014). Within this policy framework, the government expresses its dedication to ensuring Ireland is a country in which children's rights are respected, protected, and fulfilled, in addition to ensuring their voices are heard. In contrast, a dearth of research currently exists in relation to the lived perspectives of autistic children (DePape & Lindsay, 2016; Tesfaye et al., 2019), including little evidence to suggest that autistic children are asked for their opinion on the acceptability of interventions implemented during research studies. The inclusion of the voice of the child in this study was not feasible due to the time constraints of the doctoral programme, but nevertheless acted as a limitation to the validity of the study.

## 4.4 Ethical Dilemmas

The participants of the current research project included preschool and primary school-aged autistic children, who are deemed a vulnerable cohort. Prior to study

commencement, thorough deliberation regarding ethical research practice was required. In hindsight, the researcher's primary focus in relation to ethics was the protection of participants' personal information, and the protection of the rights and dignity of the participating children. First and foremost, this resulted in a careful data collection, and data protection plan being drawn up. This plan included details of how the data would be anonymised, and stored. All videos were transferred from the camera memory card on the day of data collection, anonymised, and saved to an external hard drive, purchased specifically for the research process. This hard drive did not leave the home of the researcher. Further, time was spent preparing visuals, social stories, and child assent sheets to ensure that children were prepared for the research process, understood what it involved, and respected their right to withdraw independent to that of their parents and/or teacher. A copy of these resources are provided in Appendix E.

Although, the above-mentioned are still considered prudent, the researcher neglected to reflect on the management of data collection procedures in the instance that children within a class group were not participating. Due to the extensive time and planning, the researcher assumed that all children and parents would be satisfied to participate. However, parental consent was not gained from four parents in this study. In essence, despite the meticulous planning, and the assurances of ethical practice given to parents, there remained reservations. Upon reflection, it was recognised that the researcher may have overlooked the age, vulnerability of the children, and the protective instincts of parents, due to the researcher's own enthusiasm for exploring this area. Children participating in the study were seven years and younger, and were pre-verbal or minimally verbal. It is therefore, reasonable to assume that parents had reservations around permitting an unfamiliar adult to collect personal information and video data in relation to their child, in their absence. Due to the heterogeneous nature of ASD symptomology, and the impetus to provide evidence-based intervention for this cohort, researchers frequently ask for parents to trust them to analyse their child's behaviour, presentation, and abilities. Perhaps more careful consideration needs to be given to the needs and rights of parents in the research process. While careful planning was undertaken in this study to protect the rights, dignity, and anonymity of the children, little consideration was given to the thoughts, and feelings of parents in relation to the research. This will inform the researcher's future research practices. For instance, if this study was

to be conducted again, in addition to a parent information letter, an information evening for parents would be held regarding the research process. This would provide a safe environment for parents to meet the researcher, understand the process, and ask any questions they may have.

An additional unanticipated ethical dilemma encountered during the research process was the difficulty in balancing respecting parents' wishes and minimally disrupting the excluded children's typical routine. Prior to data collection, it was decided with the class teacher that children not participating in the research process would be removed from the classroom during filming. This was intrusive, and disruptive to their routine, and caused them to forego participation in the group while the researcher was present. This has increased the awareness of the potential impact of a researcher in the naturalistic environment and will inform future decision-making in relation to data collection procedures.

Thirdly, ASD research generally tends to provide autistic children's intelligence quotient (IQ) or mental age (MA) score when discussing child demographics. This may be due to the co-morbidity rate between ASD and learning difficulties and the influence of dual-diagnoses on child outcomes (Srivastava, & Schwartz, 2014). In relation to this area, previous findings suggest that autistic children with higher mental age scores displayed higher rates of learning joint attention skills (Wong, Kasari, Freeman, & Paparella, 2007). Thus, identifying mental age as a potential covariate when interpreting findings for this study. However, at the time of study, 12 children were waitlisted for cognitive assessments with their respective disability services, resulting in the cognitive ability scores of participating children being unavailable. Although the researcher is a trainee educational psychologist (TEP) and has used cognitive assessment tools in practice, the administration of a cognitive assessment to the children in the study would have been unethical for a number of reasons. First, the TEP is not yet qualified, and therefore not accredited to administer an assessment of this calibre without the supervision of a qualified psychologist. Second, research has found repeated exposure to an assessment tool can impact on future performance and lead to a less accurate representation of ability as a result of practice effects (Mollica, Maruff, Collie, & Vance, 2005). Therefore, indicating that exposing children to an assessment tool, while waitlisted for assessment would have been unethical.

## 4.5 Implications of the Current Research to Educational Psychology Knowledge and Practice

As outlined throughout the body of this thesis, an enduring gap presently exists between research and practice in the area of school-based research (Guldberg et al., 2017). Moreover, empirical evidence suggests that a further gap exists between research and policy in relation to evidence-based practice (Dunsmuir & Kratochwill, 2013). Initially the role of the educational psychologist (EP) was primarily assessment, with the EP being viewed by schools as 'gatekeeper' to resources (Passenger, 2013, p.22). The role has since transformed, whereby the EP is now conceptualised as central to assessment, consultation, intervention, training, and research (Fallon, Woods, & Rooney, 2010). The following sections provide an overview of the implications of the current research in terms of knowledge, practice, and policy. With regard to practice, this section of the review will primarily focus on how this research may contribute to EP practice regarding intervention and research. Additionally, the researcher will exemplify how EPs might bridge the research-policy-practice gap, using this research as an example.

**4.5.1 Implications for the role of intervention.** The EP's role in relation to intervention is not restricted to the implementation of psychological intervention, psychologists are also expected to be competent in recommending, and evaluating intervention for key stakeholders (British Psychological Society, 2019). A recent systematic review carried out identified 31 evidence-based interventions for autistic children (Bond et al., 2016). A recent study conducted by Robinson, Bond, and Oldfield (2018) surveyed 146 educational psychologists in Ireland and the United Kingdom (UK) regarding their use of these 31 interventions, in practice. Although EPs reported using many of the evidence-based interventions, there were many interventions in which EPs reported being unfamiliar with, and/or used irregularly. Most relevant to the current research was the findings in relation to joint attention intervention. The majority of participating EPs reported never using joint attention interventions and 5.9% reported being unfamiliar with joint attention interventions. This may be due to the dearth of empirical evidence supporting specific joint attention interventions for EPs to draw on. The following section will explore the need for EPs to transition from evidence-based practice to practice-based evidence, in order to fill the pre-existing gap between research and practice in the area of joint attention.

***4.5.1.1 Evidence-based practice or practice-based evidence.*** The Boulder Conference in 1949 marked the beginning of a new era in psychological practice and training (Baker & Benjamin, 2000). The need for psychologists to have an in-depth understanding of both research and practice became paramount, with updated policies stipulating the requirement for psychologists to act as both scientists and practitioners (APA, 2006). This became known as the scientist-practitioner model (Hagstorm, Fry, Cramblet, & Tanner, 2007), which specifies that psychologists' practice should involve the integration of scientific knowledge into practice (Jones & Mehr, 2007). The underlying principles of the scientist-practitioner model provide a rationale for the adoption of an evidence-informed approach to intervention.

Evidence-based practice was initially conceptualised for the area of medicine (Chambless & Ollendick, 2001) and later adopted by the field of psychology (Venter & Buys, 2016). Evidence-based practice is defined as the combination of scientific evidence and clinical expertise that promotes best outcomes for the client (APA, 2006). Evidence-based practice is considered the gold-standard approach to intervention, thus there is an impetus for EPs to ensure they adopt this model to their practice. However, there is a considerable disparity between what research deems evidence-based, and what practitioners implement (Stahmer, Dababnah, & Rieth, 2019). When identifying evidence-based practice, the American Psychological Association (2002) has acknowledged two primary facets for the evaluation of intervention: treatment efficacy, and clinical utility. Treatment efficacy is concerned with the availability of empirical evidence regarding a particular intervention. Clinical utility is related to the applicability and feasibility of an intervention in the intended setting (Hollon, Miller, & Robinson, 2002). The majority of research available pertains to treatment efficacy, oftentimes neglecting clinical utility. McNeill (2019) concludes that copious literature regarding evidence-based ASD interventions with regard to efficacy exists, however literature in relation to its applicability to practitioners remains inadequate. Hence, evidence-based practice research, to date, has answered the 'what works' question, while failing to answer the 'how' and 'for whom' questions (McNeill, 2019, p.2).

There is a substantial amount of evaluative research required in order for an intervention to be considered evidence-based. This process involves evaluating the quality of the research which supports the intervention (Fox, 2003). Figure 9 displays the

hierarchy established to evaluate the quality of research conducted in intervention efficacy research (Fox, 2003).

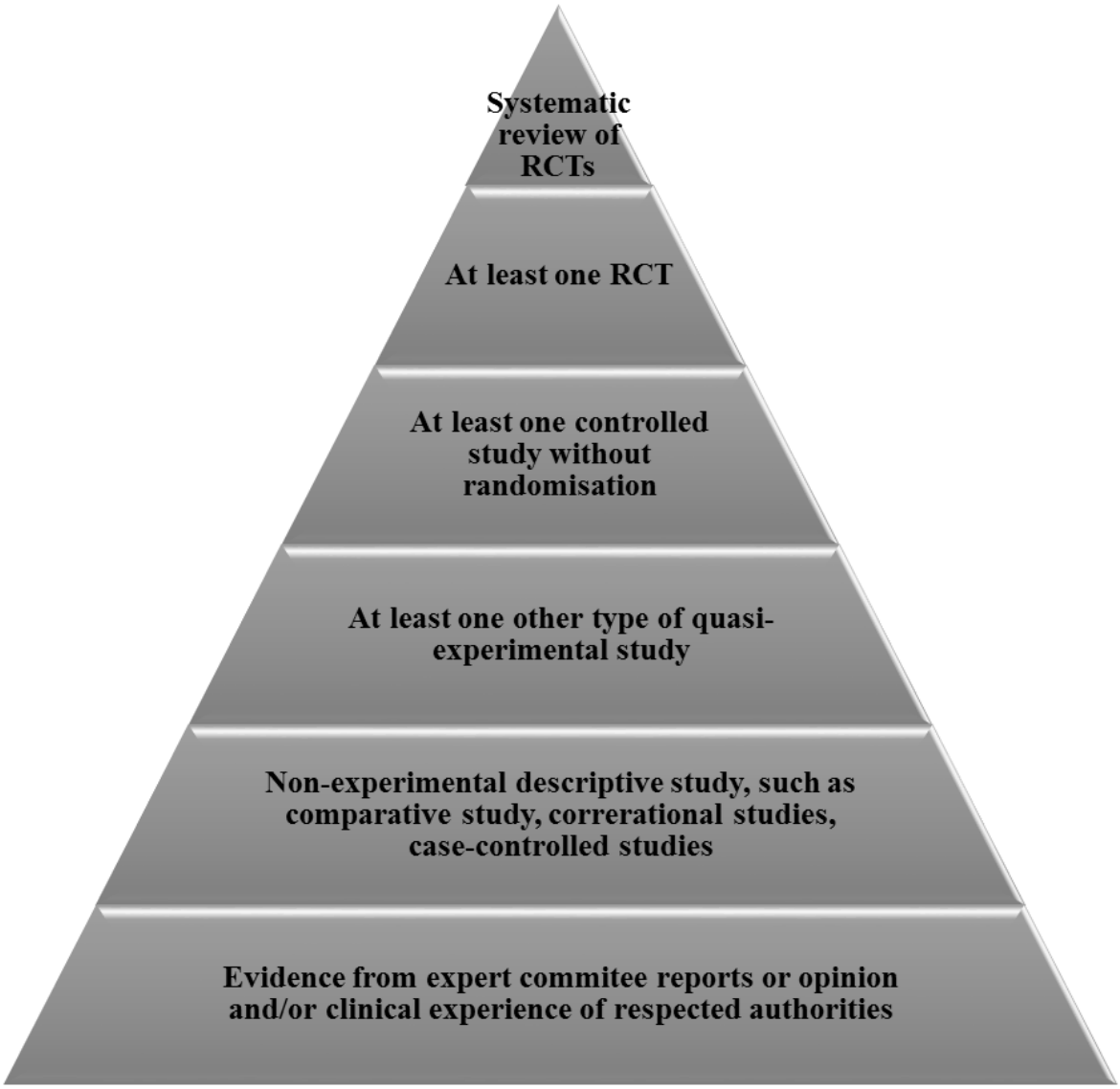



*Figure 9.* Hierarchy of Research Evidence (Fox, 2003)

There is a significant body of literature suggesting that many interventions that are considered evidence-based lack ecological validity (Stahmer et al. 2019), which may be exacerbated by the emphasis placed on RCT. Fox (2011), suggests that EPs acknowledge the importance of research to their practice while rejecting the gold standard of RCT. In order to bridge the research to practice gap, researchers and school personnel must collaborate to ensure research findings are generalisable and applicable to the

intended setting. In this instance, subscribing to the conceptual framework of practice-based evidence may be more appropriate. Practice-based evidence is concerned with measuring outcomes in the real-world setting, as opposed to the use of controlled experiments (Barkman & Mellor-Clark, 2003). Shapiro (1996) advocated for the use of practice-based evidence as complementary to evidence-based practice. This encourages a transition from a unidirectional to a bidirectional relationship between researchers and practitioners to ensure intervention research answers all three of the abovementioned questions of 'what', 'how', and 'for whom' (McNeill, 2019; Schreibman et al., 2015; Stahmer et al., 2019).

In the context of the current research and preceding literature, it appears imperative that EPs use their psychological and scientific skills to evaluate joint attention interventions such as Attention Autism being used in schools. It is therefore important to distil within EPs that interventions which lack empirical evidence are best deemed untested rather than ineffective (APA, 2006). Attention Autism is an intervention being used in the current context. However, empirical evidence regarding the treatment efficacy or clinical utility of it as an intervention is not available for practitioners. Given the overwhelming emphasis placed on evidence-based practice, combined with the limited resources EPs are currently working with, further exploration of this intervention may be inhibited, despite positive outcomes reported by the current research, and/or the reports of school staff. This research acknowledges the EPs' role in evaluating both the effectiveness and feasibility of school-based intervention. In order for joint attention interventions such as Attention Autism to be effectively implemented in the school setting, EPs must collaborate with schools to ensure they remain cognisant of the school context, and clinical utility of the intervention. This may be achieved by EPs altering their current intervention practices to include practice-based evidence, rather than relying solely on evidence-based practice. Figure 10 provides a visual of what this transition may look like in practice.

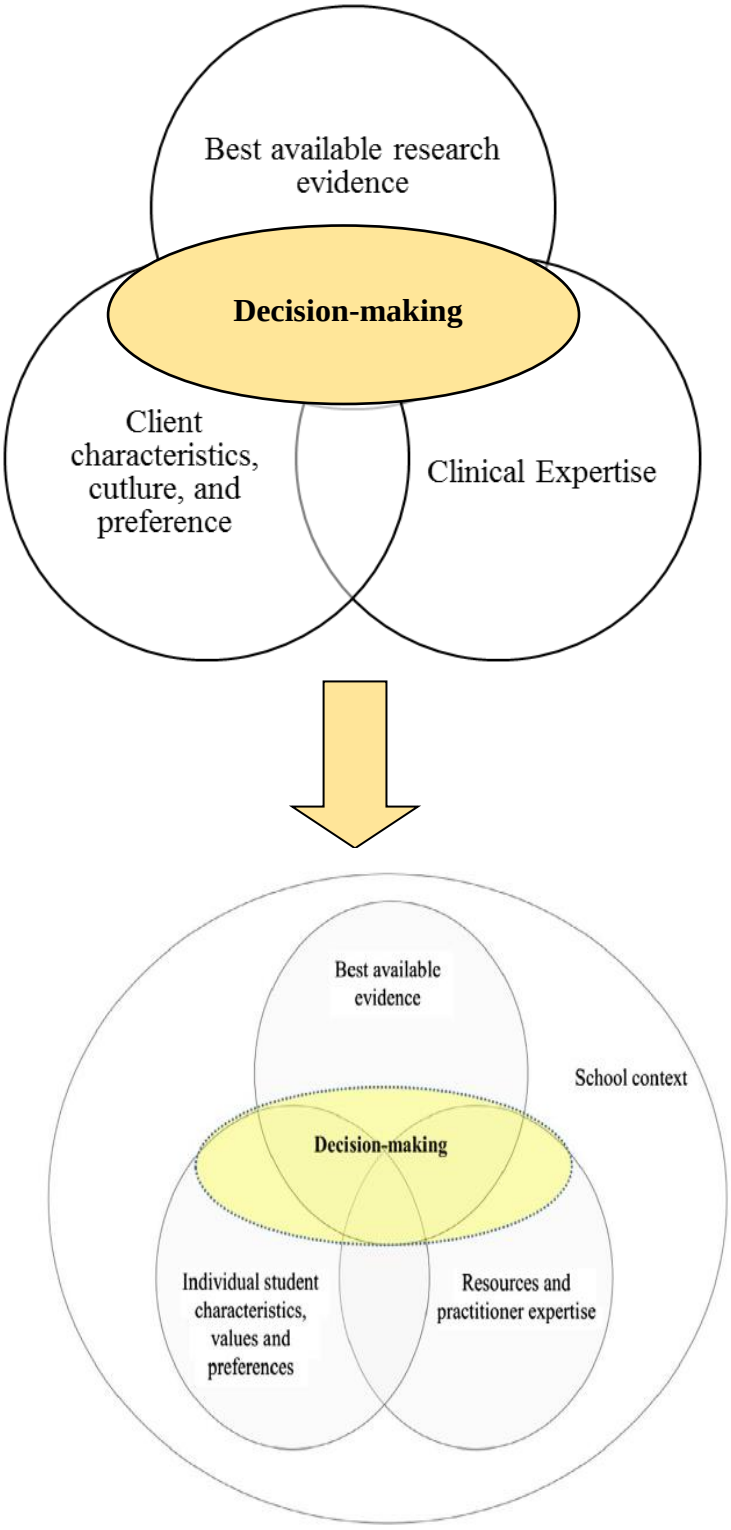



*Figure 10.* Updated Model of Evidence-Based Practice (APA, 2006; Robinson et al., 2018; Spring et al., 2007)

**4.5.2 Implications for the role of research.** Eodanable and Lauchlan (2009) referenced the shortcomings of EPs in the field of research, suggesting that while EPs

acknowledge the importance of research to their practice, they also recognise their limited contribution to conducting research. Identified barriers to the EP assuming the role of researcher include limited resources and waitlist demands within services (Forman, Fagley, Chu, & Walkup, 2012). However, Keith (2008) argued that in spite of the paucity of EP-led research, EPs continue to operate as scientist-practitioners, and incorporate their research skills into their practice. He divided the role of the practicing psychologist as researcher into three distinct categories: consumer, distributor, and conductor. To practice as a consumer of research, the EP uses their research skills to find, read, and critique relevant research in order to inform their practice. An EP assumes the role of distributor by reading, summarising, drawing conclusions, and subsequently sharing this knowledge with relevant stakeholders. Finally, the minority may act as conductors, who actively carry out research studies to contribute to the field.

The author of this thesis embodied all three research roles throughout this process. First and foremost, the author assumed the role of conductor through the implementation of this quasi-experimental study. Second, the systematic review completed for the review paper exemplifies the author acting as a consumer and distributor of research. Thirdly, the author will distribute this research by presenting the findings of the current study to two educational psychology cohorts and the staff of the Doctorate in Education and Child Psychology programme in Mary Immaculate College. Further, the author hopes to disseminate the findings through publication of an empirical paper in the Journal of Educational Psychology in Practice. Finally, the author will provide a summary of results to the teachers who participated in the study. It is also pertinent to consider the implications of the present research for practicing EPs. The following section will provide an overview of the possible implications of this research to the knowledge and practice of EPs in relation to their roles as consumers, distributors, and conductors of research.

#### *4.5.2.1 The educational psychologist as consumer and distributor of research.*

This research begins the discourse regarding school-based joint attention intervention research in Ireland. This piece of research not only provides promising evidence for the potentially successful targeting of joint attention in the school setting but also challenges the role of the EP in relation to evidence-based practice. Preceding research in the area of joint attention has emphasised the pivotal role joint attention plays in the developmental outcomes of autistic children (Wong & Kasari, 2012). Further, teachers have been

identified as ideal interventionists to target joint attention (Lawton & Kasari, 2012) and positive results, albeit limited, have been found for school-based intervention in the area (Chang et al., 2016; Kaale et al., 2012; Lawton & Kasari, 2012). The current research sought to utilise an experimental research design to test the efficacy of the Attention Autism intervention in the naturalistic environment. Positive results were found in relation to promotion of joint attention skills and the social validity of the intervention. It is hoped that through engagement with the current study, practitioners may be reminded of the importance of targeting joint attention for autistic children, particularly in the school setting. In addition to highlighting the promising evidence found for Attention Autism, this research may encourage the use of practice-based evidence, and challenge thinking in relation to the social validity of ASD interventions currently considered evidence-based. Due to the overwhelming demand for EPs in the school setting, consultation is now a primary method of service delivery, both nationally and internationally (Nugent et al., 2014). Furthermore, the National Educational Psychological Service (NEPS) in Ireland presently facilitate support groups for ASD teachers. This provides two potential scenarios in which EPs can assume the role of change agent and share the current research findings with teachers.

***4.5.2.2 The educational psychologist as a conductor of research.*** The role an EP plays in relation to intervention is not restricted to their implementation of individual psychological interventions but also expands to the evaluation of interventions. McKenney, Dorencz, Bristol, and Hall (2015) conducted a review of ASD literature published in educational psychology journals and subsequently found that the most common type of ASD research was evaluative intervention studies. This was considered a strength in the field. The current research found that Attention Autism is an intervention model being employed in ASD classrooms in Ireland. Similarly, Attention Autism was an intervention mentioned by Irish and UK educational psychologists when asked to complete a survey regarding intervention practices (Robinson et al., 2018). Therefore, Attention Autism may be an intervention that EPs observe in classrooms, or hear of during consultation. As outlined earlier, RCTs while considered the gold standard of experimental design, can impinge on external validity, by neglecting the naturalistic setting. This research may encourage practitioners to support teachers to engage in action research in order to evaluate outcomes of the Attention Autism intervention. In this

instance, the EP is ideally positioned to support the teacher in the target setting and monitoring of outcomes using evaluative frameworks (Dunsmuir et al., 2009). This may contribute to the evidence base of Attention Autism while maintaining ecological validity.

### 4.6 Implications for Future Research

This study reported promising results regarding the effectiveness of Attention Autism. This is valuable, relevant, and promising evidence in the current context. Taking into account the current study's strengths and limitations and its position in the context of preceding research, suggestions for future research are outlined.

The results of this research study are based on a small sample size of children and teachers, which potentially limits their generalisability. Future research may consider replicating this study to engage a larger sample. This may provide clarity on the effectiveness of the Attention Autism intervention. The intervention duration in the current study was six weeks and similar to previous research did not collect follow-up data. Prospective studies may wish to extend the intervention period, in order to enhance consolidation and ascertain optimal intervention length. The collection of follow-up data in future studies would be beneficial in investigating the possible long-term effects of the intervention.

Potential changes in Irish educational policy such as The Brunswick Model (NCSE, 2019c) may lead to the eradication of special class settings. As stated, the impact of poor joint attention in the classroom setting can deter learning, engagement, and participation for children. Attention Autism has been created for implementation in small group settings, thus adoption of the model has been within the ASD class setting in Ireland to date. If special class settings cease to exist, we must question how interventions such as Attention Autism could be incorporated into the mainstream setting to meet autistic children's core needs. Future research could explore the feasibility of implementing Attention Autism in the mainstream setting via the special education teacher.

Previous school-based research in this area also measured the generalisation of skills across contexts by measuring joint engagement with parents during play interactions. Future research might replicate this approach and consider the impact of engagement in Attention Autism across home and school contexts. Additionally, future

research may also investigate the effects of the intervention on the joint engagement of children during peer play.

The previous suggestions relate to the need for future research to investigate the effectiveness of Attention Autism as an intervention to foster joint attention. In addition to this, it is essential to also mention the future research which is needed in relation to targeting joint attention for autistic children more generally. It is important that research further explores Irish teachers' knowledge and use of intervention to target this core deficit. Due to the heterogeneous nature of ASD symptomology, it has been concluded that no one approach is considered superior to others for all autistic children (Department of Education Northern Ireland (DENI), 2001). Therefore, it is important that a one size fits all approach is not adopted with regard to joint attention intervention. Preceding research has examined a variety of methodologies and interventions to target joint attention, future Irish research should explore the use of differing methodologies and strategies, and their potential efficacy in improving joint attention in the school context.

### 4.7 Implications for Policy

Throughout this thesis, the reader's attention has been drawn to the pre-existing research to practice gap evident in educational intervention research. This next section will elucidate the gap present between policy and research, and the role of EP as change agent in this context also. Researchers and policymakers have historically been identified as two distinct categories of professionals, who hold differing perspectives and priorities (Dunsmuir & Kratochwill, 2013). Once again, EPs are viewed as ideally positioned, and suitably qualified to act as a change-agent to bridge the gap between research, practice, and policy (Dunsmuir & Kratochwill, 2013). The researcher will subsequently use the preceding research evidence, in addition to the findings of the current study to make suggestions of how this research to policy gap may be bridged.

The review paper of this thesis provides an overview of the substantial reform of the Irish educational system on behalf of autistic children. Provision of educational settings, initial teacher education, and CPD has been informed by foregoing policy. More recently, the NCSE issued a policy advice paper in relation to supporting autistic children in school (NCSE, 2015). The policy advice provided was evidence-informed, considered the current context, and provided a myriad of advice on how best to support autistic

children in the school setting. Principle four of this document advocated for autistic children to have access to a "wide-ranging curriculum that is relevant and appropriate to their needs" (NCSE, 2015, p. 24). In order to subscribe to this principle, it may be necessary for future policy to delineate this 'wide-ranging curriculum' for teaching staff. Moreover, the policy advice document includes joint attention interventions within a list of effective interventions, for use in school, with autistic children (NCSE, 2015). In spite of the former, there remains a dearth of research in relation to the knowledge, and practice of Irish teachers in relation to joint attention. In 2007, the National Council for Curriculum and Assessment (NCCA) published teacher guidelines, which provided an adaption of the national curriculum to guide teachers' instruction, and meet the needs of children with general learning disabilities. However, to date, no specific curricular guidelines have been published to support autistic children's curriculum access. Therefore, outlining the potential misconception held by policymakers that the content of our national curriculum is of equal relevance to our autistic children.

The pre-existing primary school curriculum (NCCA, 1999) has been recently reviewed. The NCCA have subsequently published a draft primary curriculum for consultation (NCCA, 2020). Although not specific to autistic children, one of the principles of the proposed curriculum is 'inclusive education and diversity' (NCCA, 2020, p.6). The rationale for this review is due to reported challenges with the current curriculum, one such challenge relates to engaging and supporting every child as a learner (NCCA, 2020). This is perhaps the most relevant to autistic children. The findings of this research study provide promising results for the Attention Autism intervention, and its ability to foster joint attention and joint engagement skills, in addition to its potential feasibility for the ASD classroom. In light of current policy and the present research findings, it is recommended that prospective curricula reflect the importance of targeting the core deficit of joint attention, in the school setting. In addition, future policy and curriculum should promote the ability of teachers to deliver joint attention interventions in the classroom setting through CPD, while remaining cognizant of the school context and resources.

The current study found that autistic children displayed significant increases in joint engagement with their teacher pre- to post-intervention in the Attention Autism group. However, significant results were not found during other teacher led groups.

Attention Autism aims to provide children with an irresistible invitation to learn through its use of visually engaging materials (Davies, 2013). This may result in more engagement from children than in traditional teacher led groups. As mentioned, there is a need for policy and curricula to be relevant and appropriate to the needs of autistic children. The inclusion of more motivating, and engaging teaching strategies, such as those used during Attention Autism, should be taken into consideration by policy makers if they are to create ASD specific teaching guidelines.

The previous sections have outlined the potential implications of this research for future policy. However, the research to policy gap remains. The use of evaluation in education and psychology research originated within the post-positivist paradigm (Mertens, 2014). Initially evaluation within a quasi-experimental design was concerned with the measurement of outcomes. However, it was later found that the use of objective scientific methods to report outcomes, inconsistently influenced policy makers' decisions (Mertens, 2014). This led to the definition of evaluation being extended to include an informative process which collects and reports descriptive information to guide decision-making, rather than being narrowly conceptualised as the achievement of objectives (Stufflebeam, Madaus, & Kellaghan, 2000). This guided the formation of evaluative models such as the Context, Input, Process, Product (CIPP) model of evaluation produced by Stufflebeam et al. (1983). Within this model, the context element is concerned with defining goals through the identification of needs, problems, and opportunities. Input refers to the evaluation of resources used and needed to implement the programme. Process evaluation is concerned with the assessment of the programme implementation. Finally, product evaluations explore the outcomes of the programme, in an effort to assess effectiveness (Stufflebeam et al., 2000). Future application of an evaluative model to the current intervention may support EPs and policy makers' communication regarding policy-related decision-making. Figure 11 outlines sample evaluative questions for each component of the CIPP model that may be answered with future research.

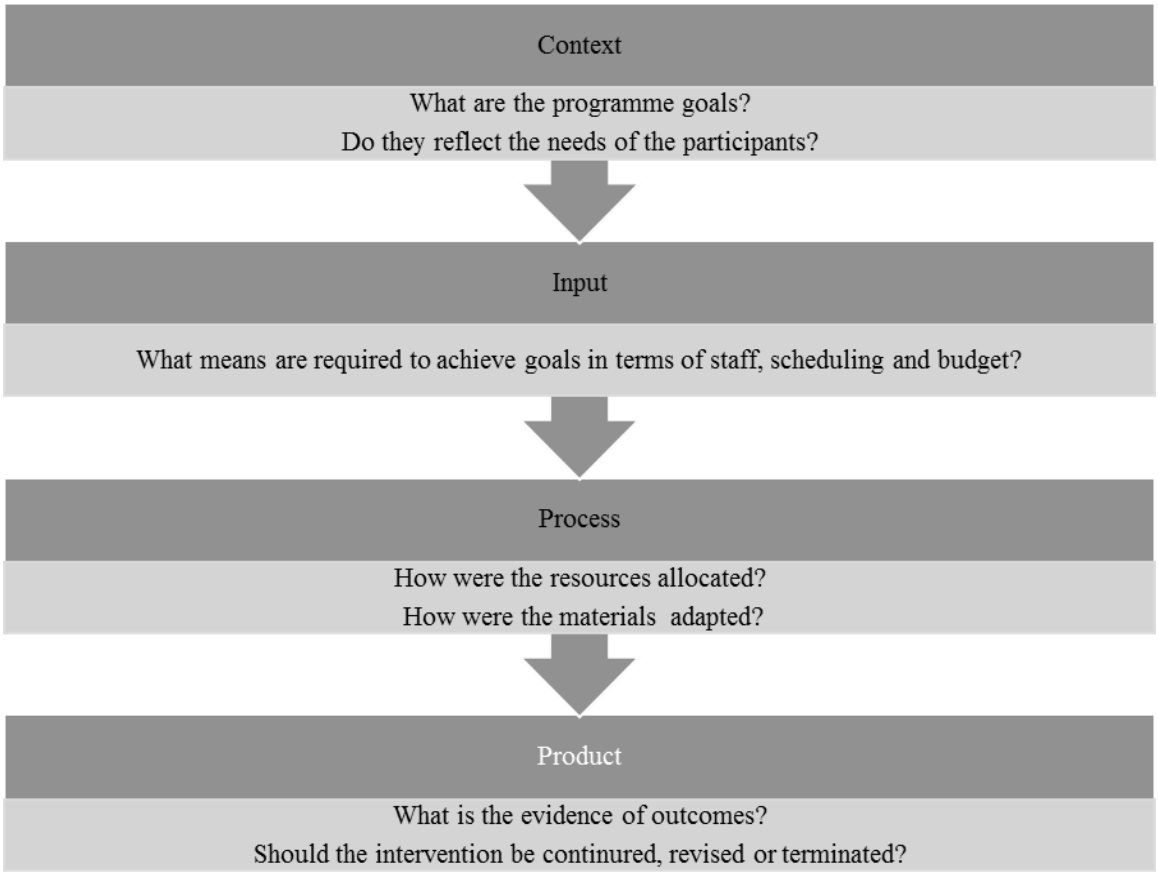



*Figure 11.* CIPP Model of Evaluation (Adapted from Mertens, 2014)

### 4.8 Researcher Reflection

Experimental designs have been recognised as the most appropriate method to draw causal conclusions (Slavin, 2002). Therefore, to answer this study's research question regarding the efficacy of the Attention Autism intervention, a quasi-experimental design was employed. As stated earlier, to comprehensively evaluate an intervention, the researcher must investigate beyond outcomes (Stufflebeam, Madaus, & Kellaghan, 2000). Post-positivism offered theory-based evaluation as another approach. This involves the creation of a theoretical model of how the intervention works, using pre-existing psychological theory, and/or the theories held by the key stakeholders (Mertens, 2014). Keith (2008) states that the skill of evaluation is central to the quality of research a practitioner can carry out while identifying EPs as well-positioned to carry out such evaluations. Prior to conducting research, Donaldson (2007) asserts that the underlying theory of an intervention must be examined, this then supports the formation

of research questions, and methods. In order to engage in theory-based evaluation for the current study, the researcher first identified the intervention as being underpinned by developmental learning theory (Vygotsky, 1978). The researcher came to this decision through attendance at the Attention Autism CPD offered by MCA, and interaction with the preceding joint attention literature. This then informed the research questions and methods used. The researcher observed a total of six sessions of Attention Autism in practice. The following section will explore the researcher's theory-based evaluation of the methods used in Attention Autism, based upon their observations of the intervention in practice during the course of this research study. The perceived strengths and limitations of the intervention will also be outlined.

As previously outlined, Attention Autism was not borne from the discipline of Psychology but could potentially be underpinned by psychological theory. Initially, the author believed that this was a naturalistic intervention which incorporated evidence-based ASD strategies, and could be applied within the conceptual framework of mediated learning experiences or the ZPD (Schertz et al., 2013; Vygotsky, 1978). Through interaction with the intervention model over the course of the research study, the author feels that Attention Autism may also be applied to the area of behaviourism. In a typical joint attention exchange, social stimuli act as a reinforcer for children, however, this social stimuli does not function as a reinforcer for autistic children during joint attention exchanges (Dawson, Webb & McPartland, 2005). Therefore, it has been suggested that developing contingencies to create conditioned reinforcers can be effective. Preceding psychological research in the area of behaviourism has indicated that conditioned reinforcers can be developed through repetitively pairing an adult with a variety of preferred stimuli (Jones & Carr, 2004; Taylor & Hoch, 2008). The structure and procedure of stages one and two of the Attention Autism intervention may as a result be mapped onto this classical conditioning paradigm. Behavioural research has indicated that the use of novel toys, such as those used in Attention Autism, also supports the elicitation of joint attention behaviours (Taylor & Hoch, 2008). Thus, highlighting the use of both naturalistic and behavioural techniques to teach skills during Attention Autism. As a result, the author proposes classifying Attention Autism as a naturalistic developmental behavioural intervention (NDBI). The integration of these techniques has

been recognised as particularly effective for autistic children's outcomes (Schreibman et al., 2015).

**4.8.1 Strengths of Attention Autism.** While further studies are needed to ascertain the efficacy of Attention Autism in the promotion of joint attention and joint engagement, children in the intervention group appeared to enjoy the experience. While it is important that assumptions are not made on the children's behalf, the author noted the calm and happy dispositions of the children while engaging with the intervention. This may indicate acceptability of the Attention Autism intervention from the perspective of the child. Furthermore, teachers in the intervention group described Attention Autism as a positive addition to their classroom. The teachers successfully implemented 18 sessions of Attention Autism over a six week period. In addition to including the intervention into their practice, the procedural integrity of the intervention remained intact. Additionally, the social validity measure yielded positive responses from teachers.

Joint attention encompasses many nonverbal skills such as gazing and gesturing, which are defined as forms of joint attention (Charman, 2003). Preceding literature has noted that autistic children use these forms of joint attention less than their typically developing peers (Bruinsma, Koegal, & Koegal 2004). As a result, much of the intervention research in this area has focussed on teaching specific forms of joint attention to autistic children. This approach is considered reductionist in nature as joint attention goes beyond the acquisition of gazing and gestural skills (Isaksen & Holth, 2009). Furthermore, Isaksen and Holth (2009) note that the most important and distinguishing feature of joint attention is the function which it serves. Research, therefore, specifies that effective interventions for this core deficit must teach the forms while simultaneously addressing the social function of joint attention (Jones & Carr, 2004; Mundy, 2016). The researcher believes that Attention Autism, as an intervention, has the potential to build social motivation for autistic children. As previously outlined, Attention Autism is child-led and uses resources identified in the psychological literature as most proficient in encouraging social motivation and joint attention behaviours through a process of conditioned reinforcement (Isakesen & Holth, 2009; Jones & Carr, 2004; Taylor & Hoch, 2008). Joint attention intervention literature, such as the research reporting on JASPER, have found that children improved their joint attention and joint engagement skills during observed teacher-child interactions but no significant differences were noted during

administration of the ESCS (Chang et al., 2016). This was explained by researchers as being due to the short intervention period and the presence of an unfamiliar tester. However, the present study found that children who engaged with the Attention Autism intervention improved their joint attention skills during both teacher led groups and the semi-structured assessment with an unfamiliar tester. This may suggest that the active ingredient of the Attention Autism intervention lies in its ability to address both the forms and functions of joint attention, which in turn supports children's generalisation of skills across contexts. Although future research is warranted to ascertain the accuracy of this hypothesis, the researcher notes this as a considerable strength of the intervention.

**4.8.2 Barriers to implementation.** It is the opinion of the researcher that there are a number of possible challenges to the implementation of Attention Autism. In order to use Attention Autism in practice, teachers are expected to attend two-day CPD on the intervention model. This CPD is offered once annually to a small number of teachers by MCA. The Department of Education and Skills (DES) does not currently offer substitute cover for attendance, as a result, the CPD takes place on a Friday evening following school and a full day Saturday. This limits the ability of teachers to commute and access this CPD readily. Currently, MCA operates a waitlist for Attention Autism as the demand is larger than the resources available. Attention Autism is described as an intervention in which the facilitators provide children with an irresistible invitation to learn (Davies, 2013). As an approach, Attention Autism relies on the use of imaginative and visually motivating stimuli. It also relies heavily on novelty. Although these factors are mentioned in the literature as most effective in fostering joint attention in autistic children (Jones & Carr, 2004), the emphasis on novelty and imagination may be difficult for teachers to maintain in a busy classroom. Furthermore, Attention Autism is not currently manualised, therefore teachers must rely on the notes received from MCA to implement the procedures with integrity. Presently, there are online forums dedicated to teachers sharing their lesson ideas for Attention Autism. While this may indicate teachers' dedication to the continued use of Attention Autism, it may in the same vein, highlight the difficulty experienced by teachers to continually create new and exciting lessons. The purpose of Attention Autism is to use motivating stimuli to engage children in a group setting. However, engagement of autistic children is a challenge for teachers (Sparpani et al., 2016; Wong & Kasari,

2013). This questions the suitability of Attention Autism and its techniques for the newly qualified teacher (NQT), who may have limited experience engaging autistic children.

## Impact Statement

There is a significant paucity of school-based research in relation to joint attention, at a national level. A gold standard approach to teaching joint attention skills to autistic children has thus far not been established (Murza et al., 2016). In addition to this, there is uncertainty as to whether joint attention skills are directly targeted in the average ASD classroom, in Ireland. The identification of an appropriate means to foster joint attention in this setting was therefore at the fore of this piece of research. To the author's knowledge, this study is the first piece of Irish research which addresses the importance of targeting joint attention in the school setting, in addition to evaluating a possible intervention which fosters these skills. Although small in size, this study provides promising data regarding the effectiveness of using the Attention Autism intervention (Davies, 2013) as an approach to target joint attention skills in the Irish ASD class setting. It is the opinion of the author, that this research was relevant, timely, and important to the current context, and henceforth has the potential to make a unique contribution to the knowledge and practice of educational psychology. The following section will delineate the potential impact of the current research to both academia and the wider community.

### 4.9 Impact on Academia

This research provides an overview of the relevant literature in a currently under-researched area, in the Irish context. It also provides empirical evidence for a social-communication intervention presently being used in primary schools. The author has referenced the pre-existing gap between research, practice, and policy, throughout this thesis (Dunsmuir & Kratochwill, 2013; Guldberg et al., 2017). The current study seeks to fill this gap by encouraging EPs to assume their role as change-agents. Kasari and Smith (2013), encourage researchers to collaborate with schools to identify how effective ASD interventions can be developed which are responsive to the needs of individual school contexts. This study could support practicing EPs in providing psycho-education to teachers during consultation regarding joint attention and the implications of possessing difficulties with these skills. Following the positive results yielded in this study, it may

encourage EPs to support teachers in their use and evaluation of Attention Autism, going forward. This will serve to not only enhance the knowledge and understanding of this area in the field of educational psychology but also ensure teachers and EPs work together to provide relevant and developmentally appropriate support for our autistic children.

### 4.10 Impact for the Wider Community

This research provides policy makers with a clear description of the extent to which poor joint attention skills influence the ability of autistic children to successfully participate in the school setting. It has described the need for educational targets for autistic children to be developmentally appropriate and focus on their core needs: joint attention, joint engagement, and play skills (Mundy, 1995). If we are to truly meet the needs of autistic children, the aforementioned core needs must be addressed and the relevant skills taught directly (NICE, 2013). This research could support policy makers and educators in making the curriculum more accessible to autistic children. Furthermore, Irish research has reported the need for more comprehensive ASD related CPD for teachers. This research could inform the content of this CPD and further improve teacher understanding and knowledge in relation to ASD.

## References

Adamson, L. B., Bakeman, R., & Deckner, D. F. (2004). The development of symbol-infused joint engagement. *Child Development*, *75*(4), 1171-1187. doi:10.1111/j.1467-8624.2004.00732.x

Adamson, L. B., Deckner, D. F., & Bakeman, R. (2010). Early interests and joint engagement in typical development, autism, and Down syndrome. *Journal of Autism and Developmental Disorders, 40*(6), 665-676. doi:10.1007/s10803-009-0914-1

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV (4th ed.).* Arlington, VA: American Psychiatric Association.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders: DSM-5 (5th ed.).* Arlington, VA: American Psychiatric Association.

American Psychological Association (2020). PsycInfo®. Retrieved from: https://www.apa.org/pubs/databases/psycinfo/

American Psychological Association (2020). Psycharticles®. Retrieved from https://www.apa.org/pubs/databases/psycarticles/

Anderson, D. K., Lord, C., Risi, S., DiLavore, P. S., Shulman, C., Thurm, A., Welch, K., & Pickles, A. (2007). Patterns of growth in verbal abilities among children with autism spectrum disorder. *Journal of Consulting and Clinical Psychology*, *75*(4), 594-604. doi: 10.1037/0022-006X.75.4.594

Andrade, C. (2018). Internal, external, and ecological validity in research design, conduct, and evaluation. *Indian Journal of Psychological Medicine*, *40*(5), 498-499. doi: 10.4103/IJPSYM.IJPSYM_334_18

Anglim, J., Prendeville, P., & Kinsella, W. (2018). The self-efficacy of primary teachers in supporting the inclusion of children with autism spectrum disorder. *Educational Psychology in Practice*, *34*(1), 73-88. doi: 10.1080/02667363.2017.1391750

APA Presidential Task Force on Evidence-Based Practice (2006). Evidence-based practice in psychology. *The American Psychologist, 61*(4), 271 -285. doi:10.1037/0003-066X.61.4.271

Bachevalier, J., & Loveland, K. A. (2006). The orbitofrontal–amygdala circuit and self-regulation of social–emotional behavior in autism. *Neuroscience & Biobehavioral Reviews, 30*(1), 97-117. doi:10.1016/j.neubiorev.2005.07.002

Bakeman, R., & Quera, V. (2011). *Sequential analysis and observational methods for the behavioral sciences*. New York, NY: Cambridge University Press.

Baker, D. B., & Benjamin Jr, L. T. (2000). The affirmation of the scientist-practitioner: A look back at Boulder. *American Psychologist, 55*(2), 241-247. doi: 10.1037/0003-066X.55.2.241

Banks, J., McCoy, S., Frawley, D., Kingston, G., Shevlin, M., & Smyth, F. (2016). *Special classes in Irish schools phase 2: A qualitative study.* Dublin: Economic and Social Research Institute (ESRI) Research Series.

Barkham, M., & Mellor-Clark, J. (2003). Bridging evidence-based practice and practice-based evidence: Developing a rigorous and relevant knowledge for the psychological therapies. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice, 10*(6), 319-327. doi:10.1002/cpp.379

Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a "theory of mind?". *Cognition, 21*(1), 37-46.

Bates, E., Benigni, L., Bretherton, I., Camaioni, L., & Volterra, V. (1979). *The emergence of symbols: Cognition and communication in infancy.* New York: AcademicPress.

Bean, J. L., & Eigsti, I. M. (2012). Assessment of joint attention in school-age children and adolescents. *Research in Autism Spectrum Disorders, 6*(4), 1304-1310. doi:10.1016/j.rasd.2012.04.003

Billstedt, E., Carina Gillberg, I., & Gillberg, C. (2007). Autism in adults: Symptom patterns and early childhood predictors. Use of the DISCO in a community

sample followed from childhood. *Journal of Child Psychology and Psychiatry, 48*(11), 1102-1110. doi: 10.1111/j.1469-7610.2007.01774.x

Bond, C., Symes, W., Hebron, J., Humphrey, N., & Morewood, G. (2016). *Educating persons with autistic spectrum disorder–A systematic literature review*. Trim, Co.Meath: National Council for Special Education.

Bondy, A. S., & Frost, L. A. (1994). The picture exchange communication system. *Focus on Autistic Behavior, 9*(3), 1-19. doi:10.1177/0145445501255004

Bono, M. A., Daley, T., & Sigman, M. (2004). Relations among joint attention, amount of intervention and language gain in autism. *Journal of Autism and Developmental Disorders, 34*(5), 495-505. doi: 10.1007/s10803-004-2545-x

Bottema-Beutel, K., Yoder, P. J., Hochman, J. M., & Watson, L. R. (2014). The role of supported joint engagement and parent utterances in language and social communication development in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *44*(9), 2162-2174. doi: 10.1007/s10803-014-2092-z

Boyd, B. A., Watson, L. R., Reszka, S. S., Sideris, J., Alessandri, M., Baranek, G. T., ... & Belardi, K. (2018). Efficacy of the ASAP intervention for preschoolers with ASD: A cluster randomized controlled trial. *Journal of Autism and Developmental Disorders*, *48*(9), 3144-3162. doi: 10.1007/s10803-018-3584-z

Bradshaw, J., Steiner, A. M., Gengoux, G., & Koegel, L. K. (2015). Feasibility and effectiveness of very early intervention for infants at-risk for autism spectrum disorder: A systematic review. *Journal of Autism and Developmental Disorders*, *45*(3), 778-794. doi: 10.1007/s10803-014-2235-2

British Educational Research Association (BERA) (2018). *Ethical guidelines for educational research (4th ed).* London: BERA.

British Psychological Society: Division of Educational and Child Psychology (2016). *Standards for the accreditation of educational psychology training.* Leicester: British Psychological Society.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge MA: Harvard University Press.

Bruinsma, Y., Koegel, R. L., & Koegel, L. K. (2004). Joint attention and children with autism: A review of the literature. *Mental Retardation and Developmental Disabilities Research Reviews, 10*(3), 169-175. doi: 10.1002/mrdd.20036

Bruner, J. S. (1974). From communication to language—A psychological perspective. *Cognition*, *3*(3), 255-287. doi: 10.1016/0010-0277(74)90012-2

Buckingham, K. (2012). *The impact of an Attention Autism approach on joint attention skills in a key stage one class in a special school.* (Dissertation). University of Birmingham. Retrieved from: https://www.southamptoninclusion.net/wp-content/uploads/2016/02/Research-Kate-Buckingham.pdf

Carpenter, M., Nagell, K., Tomasello, M., Butterworth, G., & Moore, C. (1998). Social cognition, joint attention, and communicative competence from 9 to 15 months of age. *Monographs of the Society for Research in Child Development*. i-174. doi: 10.2307/1166214

Centre for Early Childhood Development and Education (2006). *National Quality Framework for Early Childhood Education*. Dublin: Centre for Early Childhood Development and Education.

Chambless, D. L., & Ollendick, T. H. (2001). Empirically supported psychological interventions: Controversies and evidence. *Annual Review of Psychology*, *52*(1), 685-716. doi: 10.1146/annurev.psych.52.1.685

Chang, Y. C., Shih, W., & Kasari, C. (2015). Friendships in preschool children with autism spectrum disorder: What holds them back, child characteristics or teacher behavior? *Autism*, *20*(1), 65-74. doi: 10.1177/1362361314567761

Chang, Y. C., Shire, S. Y., Shih, W., Gelfand, C., & Kasari, C. (2016). Preschool deployment of evidence-based social communication intervention: JASPER in the classroom. *Journal of Autism and Developmental Disorders*, *46*, 2211-2233. doi: 10.1007/s10803-016-2752-2

Charman, T. (2003). Why is joint attention a pivotal skill in autism?. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, *358*(1430), 315-324. doi:10.1098/rstb.2002.1199

Chawarska, K., Klin, A., Paul, R., & Volkmar, F. (2007). Autism spectrum disorder in the second year: Stability and change in syndrome expression. *Journal of Child Psychology and Psychiatry*, *48*(2), 128-138. doi:10.1111/j.1469-7610.2006.01685.x

Clifford, S. M., & Dissanayake, C. (2008). The early development of joint attention in infants with autistic disorder using home video observations and parental interview. *Journal of Autism and Developmental Disorders*, *38*(5), 791-805. doi: 10.1007/s10803-007-0444-7

Cohen, L., Mannion, L. & Morrison, K. (2007). *Research Methods in Education (6th ed.).* Oxon: Routledge.

Conn, C. (2017). Pedagogical intersubjectivity, autism and education: can teachers teach so that autistic pupils learn?. *International Journal of Inclusive Education*, *22*(6), 594-605. doi: 10.1080/13603116.2017.1390003

Conroy, M. A., Stichter, J. P., Daunic, A., & Haydon, T. (2008). Classroom-based research in the field of emotional and behavioral disorders: Methodological issues and future research directions. *The Journal of Special Education*, *41*(4), 209-222. doi: 10.1177/0022466907310369

Courtman, S. (2018). *An evaluation of the effectiveness of using the Attention Autism programme as an intervention for increasing the level of engagement during an adult led activity in pupils with autism spectrum condition.* (Dissertation). University of Birmingham. Retrieved from https://www.researchgate.net/project/An-evaluation-of-the-effectiveness-of-using-the-Attention-Autism-programme-as-an-intervention-for-increasing-the-level-of-engagement-during-an-adult-led-activity-in-pupils-with-Autism-Spectrum-Conditi

Cunningham, A. B. (2012). Measuring change in social interaction skills of young children with autism. *Journal of Autism and Developmental Disorders*, *42*(4), 593-605. doi:10.1007/s10803-011-1280-3

Daly, P., Ring, E., Egan, M., Fitzgerald, J., Griffin, C., Long, S., McCarthy, E., Moloney, M., O' Brien, T., O' Bryne, A., & O'Sullivan, S. (2016). *An*

*evaluation of education provision for students with autism spectrum disorder in Ireland.* Trim, Co. Meath: National Council for Special Education.

Davies, G. (2013). *The Attention Autism Programme.* Retrieved from: http://ginadavies.co.uk/parents-services/professional-shop/foundation/

Dawson, G., Meltzoff, A. N., Osterling, J., Rinaldi, J., & Brown, E. (1998). Children with autism fail to orient to naturally occurring social stimuli. *Journal of Autism and Developmental Disorders*, *28*(6), 479-485. doi: 10.1023/a:1026043926488

Dawson, G., Toth, K., Abbott, R., Osterling, J., Munson, J., Estes, A., & Liaw, J. (2004). Early social attention impairments in autism: social orienting, joint attention, and attention to distress. *Developmental Psychology*, *40*(2), 271-283. doi: 10.1037/0012-1649.40.2.271

Dawson, G., Toth, K., Abbott, R., Osterling, J., Munson, J., Estes, A., & Liaw, J. (2004). Early social attention impairments in autism: social orienting, joint attention, and attention to distress. *Developmental Psychology*, *40*(2), 271. doi: 10.1037/0012-1649.40.2.271

Dawson, G., Webb, S. J., & McPartland, J. (2005). Understanding the nature of face processing impairment in autism: insights from behavioral and electrophysiological studies. *Developmental Neuropsychology*, *27*(3), 403-424. doi: 10.1207/s15326942dn2703_6

Dawson, G., Rogers, S., Munson, J., Smith, M., Winter, J., Greenson, J., Donaldson, A., & Varley, J. (2010). Randomized, controlled trial of an intervention for toddlers with autism: the Early Start Denver Model. *Pediatrics*, *125*(1), e17-e23. doi: 10.1542/peds.2009-0958

DePape, A. M., & Lindsay, S. (2016). Lived experiences from the perspective of individuals with autism spectrum disorder: A qualitative meta-synthesis. *Focus on Autism and Other Developmental Disabilities*, *31*(1), 60-71. doi: 10.1177/1088357615587504

Department of Education and Science (1998). *Major initiative in special education services: Move marks breakthrough for integrated education and children with autism*. Press Release: Thursday 5th November 1998. Dublin: DES

Department of Education and Science (2001). *Educational provision and support for persons with Autistic Spectrum Disorder: Report of the Task Force on Autism*. Dublin: Stationery Office.

Department of Education (Northern Ireland). (2001). *Report of the Task Group on Autism*. Northern Ireland: Department of Education (Northern Ireland). Retrieved from file:///C:/Users/Niamh/Downloads/Task_Group_on_Autism_Report.pdf

Department of Education and Science, Inspectorate (2006). *An evaluation of educational provision for children with autistic spectrum disorders*. Dublin: Stationery Office.

Department of Education and Skills Inspectorate & Education and Training Inspectorate – Northern Ireland. (2012). *Report of an Inspection of Middletown Centre for Autism. (Inspection Report).* Ireland: Department of Education; Education and Training Inspectorate – Northern Ireland.

Department of Children and Youth Affairs (2014). *Better Outcomes Brighter Futures.* Dublin: The Stationery Office.

Department of Education and Skills (2019). *Education indicators for Ireland October 2019*. Dublin: Department of Education, Statistics Section.

Donaldson, S. I. (2007). *Program theory-driven evaluation science: Strategies and applications*. New York, NY: Routledge.

Dunsmuir, S., Brown, E., Iyadurai, S., & Monsen, J. (2009). Evidence-based practice and evaluation: From insight to impact. *Educational Psychology in Practice*, *25*(1), 53-70. doi: 10.1080/02667360802697605

Dunsmuir, S., & Kratochwill, T. R. (2013). From research to policy and practice: Perspectives from the UK and the US on psychologists as agents of change. *Educational and Child Psychology*, *30*(3), 60-71.

EBSCO (2020). Academic Search Complete. Retrieved from https://www.ebsco.com/products/research-databases/academic-search-complete

Egan, M., (2018). Effective strategies to promote successful learning. In E. Ring, E. Wall, & P. Daly (Eds.), *Autism from the inside out: A handbook for parents, early childhood, primary, post-primary and special school settings* (pp. 19-45). New York, NY: Peter Lang Publishing Group.

Elliot, C. D., Smith, P., & McCulloch, K. (2011). *British Ability Scales II*. Windsor: NFER-Nelson.

Eodanable, M., & Lauchlan, F. (2009). The advance of research and evaluation skills by EPs: Implications for training and professional development. *Educational Psychology in Practice, 25*(2), 113-124. doi: 10.1080/02667360902905114

Fallon, K., Woods, K., & Rooney, S. (2010). A discussion of the developing role of educational psychologists within children's services. *Educational Psychology in Practice, 26*(1), 1-23. doi: 10.1080/02667360903522744

Farroni, T., Csibra, G., Simion, F., & Johnson, M. H. (2002). Eye contact detection in humans from birth. *Proceedings of the National Academy of Sciences, 99*(14), 9602-9605. doi: 10.1073/pnas.152159999

Fein, D., Barton, M., Eigsti, I. M., Kelley, E., Naigles, L., Schultz, R. T., ... & Troyb, E. (2013). Optimal outcome in individuals with a history of autism. *Journal of Child Psychology and Psychiatry, 54*(2), 195-205. doi: 10.1111/jcpp.12037

Flewitt, R. (2006). Using video to investigate preschool classroom interaction: Education research assumptions and methodological practices. *Visual communication, 5*(1), 25-50. doi: 10.1177/1470357206060917

Forman, S. G., Fagley, N. S., Chu, B. C., & Walkup, J. T. (2012). Factors influencing school psychologists "willingness to implement" evidence-based interventions. *School Mental Health, 4*(4), 207-218. doi:10.1007/s12310-012-9083-z

Fox, M. (2003). Opening Pandora's Box: Evidence-based practice for educational psychologists. *Educational Psychology in Practice, 19*(2), 91-102. doi: 10.1080/02667360303233

Fox, M. (2011). Practice-based evidence–overcoming insecure attachments. *Educational Psychology in Practice, 27*(4), 325-335. doi: 10.1080/02667363.2011.615299

Freeman, S. F., Gulsrud, A., & Kasari, C. (2015). Brief report: Linking early joint attention and play abilities to later reports of friendships for children with ASD. *Journal of Autism and Developmental Disorders*, *45*(7), 2259-2266. doi:10.1007/s10803-015-2369-x

Ganz, J. B., Bourgeois, B. C., Flores, M. M., & Campos, B. A. (2008). Implementing visually cued imitation training with children with autism spectrum disorders and developmental delays. *Journal of Positive Behavior Interventions*, *10*(1), 56-66. doi: 10.1177/1098300707311388

Garfield, J. L., Peterson, C. C., & Perry, T. (2001). Social cognition, language acquisition and the development of the theory of mind. *Mind & Language*, *16*(5), 494-541. doi: 10.1111/1468-0017.00180

Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C., & Innocenti, M. S. (2005). Quality indicators for group experimental and quasi-experimental research in special education. *Exceptional children*, *71*(2), 149-164.

Goods, K. S., Ishijima, E., Chang, Y. C., & Kasari, C. (2013). Preschool based JASPER intervention in minimally verbal children with autism: Pilot RCT. *Journal of Autism and Developmental Disorders*, *43*(5), 1050-1056. doi: 10.1007/s10803-012-1644-3

Gotham, K., Risi, S., Pickles, A., & Lord, C. (2007). The autism diagnostic observation schedule: Revised algorithms for improved diagnostic validity. *Journal of Autism and Developmental Disorders*, *37*(4), 613-627. doi: 10.1007/s10803-006-0280-1

Gough, D. (2007). Weight of evidence: a framework for the appraisal of the quality and relevance of evidence. *Research Papers in Education*, *22*(2), 213-228. doi: 10.1080/02671520701296189

Government of Ireland. (1993). *Report of the Special Education Review Committee.* Dublin: Stationery Office

Government of Ireland. (1995). *White Paper on Education: Charting our education future*. Dublin: Stationery Office.

Government of Ireland (1998). *Education Act*. Dublin: Stationery Office.

Government of Ireland. (2000). *Education Welfare Act.* Dublin: Stationery Office.

Government of Ireland (2004). *Education for Persons with Special Educational Needs Act*. Dublin: Stationery Office.

Government of Ireland. (2005). *Disability Act*. Dublin: Stationery Office.

Government of Ireland (2018). *Estimating prevalence of autism spectrum disorders (ASD) in the Irish population: A review of data sources and epidemiological studies*. Dublin: Stationery Office.

Gredebäck, G., Fikke, L., & Melinder, A. (2010). The development of joint visual attention: A longitudinal study of gaze following during interactions with mothers and strangers. *Developmental Science, 13*(6), 839-848. doi: 10.1111/j.1467-7687.2009.00945.x

Grey, I. M., Honan, R., McClean, B., & Daly, M. (2005). Evaluating the effectiveness of teacher training in applied behaviour analysis. *Journal of Intellectual Disabilities*, *9*(3), 209-227. doi: 10.1177/1744629505056695

Griffin, S., & Shevlin, M. (2011). *Responding to special educational needs: An Irish perspective*. Dublin: Gill & Macmillan.

Guldberg, K., Parsons, S., Porayska-Pomsta, K., & Keay-Bright, W. (2017). Challenging the knowledge-transfer orthodoxy: Knowledge co-construction in technology-enhanced learning for children with autism. *British Educational Research Journal*, *43*(2), 394-413. doi: 10.1002/berj.3275

Hagstrom, R. P., Fry, M. K., Cramblet, L. D., & Tanner, K. (2007). Educational psychologists as scientist-practitioners: An expansion of the meaning of a scientist-practitioner. *American Behavioral Scientist, 50*(6), 797-807. doi: 10.1177/0002764206296458

Hagtvet, B., Lillestølen, R., & Reynell, J. (1985). *Manual for Reynell Developmental Language Scales.* Oslo: Universitetsforlaget.

Hess, K. L., Morrier, M. J., Heflin, L. J., & Ivey, M. L. (2008). Autism treatment survey: Services received by children with autism spectrum disorders in public school classrooms. *Journal of Autism and Developmental Disorders*, *38*(5), 961-971. doi:10.1007/s10803-007-0470-5

Hollon, D., Miller, I. J., & Robinson, E. (2002). Criteria for evaluating treatment guidelines. *American Psychologist*, *57*(12), 1052-1059.

Hungate, M., Gardner, A. W., Tackett, S., & Spencer, T. D. (2019). A convergent review of interventions for school-age children with autism spectrum disorder. *Behavior Analysis: Research and Practice*, *19*(1), 81-93. doi: 10.1037/bar0000090

Institute of Education Sciences (2020). ERIC. Retrieved from: https://eric.ed.gov/?Journals

International Business Machines Corporation (IBM) (2019). *Statistical Package for the Social Sciences, Version 26*. New York: International Business Machines Corporation.

Inter-Departmental Group. (2015). *Supporting access to the early childhood care and education programme for children with a disability.* Dublin: Inter-Departmental Group. Retrieved from: http://nda.ie/nda-files/Supporting-Access-to-the-Early-Childhood-Care-and-Education-for-Children-with-a-Disability.pdf

Isaksen, J., & Holth, P. (2009). An operant approach to teaching joint attention skills to children with autism. *Behavioral Interventions: Theory & Practice in Residential & Community-Based Clinical Programs*, *24*(4), 215-236. doi:10.1002/bin.292

Jones, E. A., & Carr, E. G. (2004). Joint attention in children with autism: Theory and intervention. *Focus on Autism and other Developmental Disabilities*, *19*(1), 13-26. doi: 10.1177/10883576040190010301

Jones, J. L., & Mehr, S. L. (2007). Foundations and assumptions of the scientist-practitioner model. *American Behavioral Scientist*, *50*(6), 766-771. doi: 10.1177/0002764206296454

Jordan, R. (2005). Managing autism and Asperger's syndrome in current educational provision. *Paediatric Rehabilitation*, *8*(2), 104-112. doi: 10.1080/13638490500054891

Kaale, A., Smith, L., & Sponheim, E. (2012). A randomized controlled trial of preschool-based joint attention intervention for children with autism. *Journal of Child Psychology and Psychiatry*, *53*(1), 97-105. doi: 10.1111/j.1469-7610.2011.02450.x

Kasari, C., Freeman, S., & Paparella, T. (2006). Joint attention and symbolic play in young children with autism: A randomized controlled intervention study. *Journal of Child Psychology and Psychiatry*, *47*(6), 611-620. doi: 10.1111/j.1469-7610.2005.01567.x

Kasari, C., Paparella, T., Freeman, S., & Jahromi, L. B. (2008). Language outcome in autism: Randomized comparison of joint attention and play interventions. *Journal of Consulting and Clinical Psychology*, *76*(1), 125-137. doi: 10.1037/0022-006X.76.1.125

Kasari, C., Gulsrud, A. C., Wong, C., Kwon, S., & Locke, J. (2010). Randomized controlled caregiver mediated joint engagement intervention for toddlers with autism. *Journal of Autism and Developmental Disorders*, *40*(9), 1045-1056. doi: 10.1007/s10803-010-0955-5

Kasari, C., & Smith, T. (2013). Interventions in schools for children with autism spectrum disorder: Methods and recommendations. *Autism*, *17*(3), 254-267. doi: 10.1177/1362361312470496

Kasari, C., Lawton, K., Shih, W., Barker, T. V., Landa, R., Lord, C., ... & Senturk, D. (2014). Caregiver-mediated intervention for low-resourced preschoolers with autism: An RCT. *Pediatrics*, *134*(1), e72-e79. doi: 10.1542/peds.2013-3229

Kasari, C., Gulsrud, A., Paparella, T., Hellemann, G., & Berry, K. (2015). Randomized comparative efficacy study of parent-mediated interventions for toddlers with autism. *Journal of Consulting and Clinical Psychology*, *83*(3), 554-563. doi: 10.1037/a0039080

Keen, D., Sigafoos, J., & Woodyatt, G. (2005). Teacher responses to the communicative attempts of children with autism. *Journal of Developmental and Physical Disabilities, 17*(1), 19-33. doi: 10.1007/s10882-005-2198-5

Keith, T. Z. (2008). Best practice in using and conducting research in applied settings. In A.Thomas & J. Grimes (Eds.), *Best practices in school psychology-V* (pp. 2165-2175). Bethesda, MD: NASP.

Kenny, L., Hattersley, C., Molins, B., Buckley, C., Povey, C., & Pellicano, E. (2016). Which terms should be used to describe autism? Perspectives from the UK autism community. *Autism, 20*(4), 442-462. doi: 10.1177/1362361315588200

Klin, A. (1991). Young autistic children's listening preferences in regard to speech: A possible characterization of the symptom of social withdrawal. *Journal of Autism and Developmental Disorders, 21*(1), 29-42. doi: 10.1007/bf02206995

Koegel, L. K., Vernon, T. W., Koegel, R. L., Koegel, B. L., & Paullin, A. W. (2012). Improving social engagement and initiations between children with autism spectrum disorder and their peers in inclusive settings. *Journal of Positive Behavior Interventions*, *14*(4), 220-227. doi: 10.1177/1098300712437042

Landa, R. J. (2018). Efficacy of early interventions for infants and young children with, and at risk for, autism spectrum disorders. *International Review of Psychiatry*, *30*(1), 25-39. doi: 10.1080/09540261.2018.1432574

Lawton, K., & Kasari, C. (2012). Teacher-implemented joint attention intervention: Pilot randomized controlled study for preschoolers with autism. *Journal of Consulting and Clinical Psychology*, *80*(4), 687-693. doi: 10.1037/a0028506

Ledford, J. R., Hall, E., Conder, E., & Lane, J. D. (2015). Research for young children with autism spectrum disorders: Evidence of social and ecological validity. *Topics in Early Childhood Special Education, 35*(4), 223-233. doi: 10.1177/0271121415585956

Lee, L. C., Harrington, R. A., Louie, B. B., & Newschaffer, C. J. (2008). Children with autism: Quality of life and parental concerns. *Journal of Autism and Developmental Disorders*, *38*(6), 1147-1160. doi: 10.1007/s10803-007-0491-0

Locke, J., Kang-Yi, C., Pellecchia, M., & Mandell, D. S. (2019). It's messy but real: A pilot study of the implementation of a social engagement intervention for children with autism in schools. *Journal of Research in Special Educational Needs*, *19*(2), 135-144. doi: 10.1111/1471-3802.12436

Lord, C., Rutter, M., & Le Couteur, A. (1994). Autism diagnostic interview-revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders*, *24*(5), 659-685. doi: 10.1007/bf02172145

Lord, C., & Jones, R. M. (2012). Annual research review: Re-thinking the classification of autism spectrum disorders. *Journal of Child Psychology and Psychiatry*, *53*(5), 490-509. doi: 10.1111/j.1469-7610.2012.02547.x

Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*, *55*(1), 3-9. doi: 10.1037/0022-006X.55.1.3

Mandell, D. S., Stahmer, A. C., Shin, S., Xie, M., Reisinger, E., & Marcus, S. C. (2013). The role of treatment fidelity on outcomes during a randomized field trial of an autism intervention. *Autism*, *17*(3), 281-295. doi: 10.1177/1362361312473666

McCoy, S., Banks, J., Frawley, D., Watson, D., Shevlin, M., & Smyth, F. (2014). *Understanding special class provision in Ireland: Findings from a national survey of schools.* Trim, Co. Meath: National Council for Special Education.

McKenney, E. L., Dorencz, J., Bristol, R. M., & Hall, L. P. (2015). Publishing about autism spectrum disorder in six school psychology journals: 2002–2012. *Psychology in the Schools*, *52*(3), 265-283. doi:10.1002/pits.21820

McMahon, J., & Cullinan, V. (2016). Exploring eclecticism: The impact of educational theory on the development and implementation of comprehensive education programmes (CEP's) for young children with autism spectrum disorder (ASD). *Research in Autism Spectrum Disorders*, *32*, 1-12. doi:10.1016/j.rasd.2016.07.005

McNeill, J. (2019). Social validity and teachers' use of evidence-based practices for autism. *Journal of Autism and Developmental Disorders*, *49*(11), 4585-4594. doi:10.1007/s10803-019-04190-y

Meindl, J. N., & Cannella-Malone, H. I. (2011). Initiating and responding to joint attention bids in children with autism: A review of the literature. *Research in Developmental Disabilities*, *32*(5), 1441-1454. doi:10.1016/j.ridd.2011.02.013

Mertens, D. M. (2014). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. London: Sage Publications.

Mesibov, G. B., Shea, V., & Schopler, E. (2005). *The TEACCH approach to autism spectrum disorders*. New York, NY: Springer Science & Business Media.

Middletown Centre for Autism. (2020a). *Middletown Centre for Autism.* Retrieved from https://www.middletownautism.com/

Middletown Centre for Autism (2020b). *Best Practice Resource- Attention Autism.* Retrieved from: https://best-practice.middletownautism.com/approaches-of intervention/attention-autism/.

Mody, M., & Belliveau, J. W. (2013). Speech and language impairments in autism: Insights from behavior and neuroimaging. *North American Journal of Medicine & Science*, *5*(3), 157-161. doi: 10.7156/v5i3p157

Mollica, C. M., Maruff, P., Collie, A., & Vance, A. (2005). Repeated assessment of cognition in children and the measurement of performance change. *Child Neuropsychology*, *11*(3), 303-310. doi: 10.1080/092970490911306

Morgan, H. (2011). *Evaluation of Attention Hillingdon: A social communication intervention for pre-schoolers with autism spectrum disorder*. (Dissertation). Institute of Education, University of London.

Morgan, L., Hooker, J. L., Sparapani, N., Reinhardt, V. P., Schatschneider, C., & Wetherby, A. M. (2018). Cluster randomized trial of the classroom SCERTS intervention for elementary students with autism spectrum disorder. *Journal of Consulting and Clinical Psychology*, *86*(7), 631-644. doi:10.1037/ccp0000314

Mullen, E. (1997). *Mullen Scales of Early Learning.* Circle Pines, MN: American Guidance Services.

Mundy, P., Sigman, M., Ungerer, J., & Sherman, T. (1986). Defining the social deficits of autism: The contribution of non-verbal communication measures. *Journal of Child Psychology and Psychiatry, 27*(5), 657-669. doi: 10.1111/j.1469-7610.1986.tb00190.x

Mundy, P., Sigman, M., & Kasari, C. (1990). A longitudinal study of joint attention and language development in autistic children. *Journal of Autism and Developmental Disorders, 20*(1), 115-128. doi: 10.1007/bf02206861

Mundy, P. (1993). Normal vs. high-functioning status in children with autism. *American Journal of Mental Retardation, 97,* 381–384.

Mundy, P., Sigman, M., & Kasari, C. (1994). Joint attention, developmental level, and symptom presentation in autism. *Development and Psychopathology, 6*(3), 389-401. doi:10.1017/S0954579400006003

Mundy, P. (1995). Joint attention and social-emotional approach behavior in children with autism. *Development and Psychopathology, 7*(1), 63-82. doi:10.1017/S0954579400006349

Mundy, P., & Neal, A. R. (2000). Neural plasticity, joint attention, and a transactional social-orienting model of autism. *International Review of Research in Mental Retardation,* 23, 139-168.

Mundy, P., Card, J., & Fox, N. (2000). EEG correlates of the development of infant joint attention skills. Developmental Psychobiology, 36(4), 325-338. doi:10.1002/(SICI)1098-2302(200005)36:4<325::AID-DEV7>3.0.CO;2-F

Mundy, P., Delgado, C., Block, J., Venezia, M., Hogan, A., & Seibert, J. (2003). *Early Social Communication Scales (ESCS).* Coral Gables, FL: University of Miami.

Mundy, P., & Newell, L. (2007). Attention, joint attention, and social cognition. *Current Directions in Psychological Science, 16*(5), 269-274. doi:10.1111/j.1467-8721.2007.00518.x

Mundy, P., & Jarrold, W. (2010). Infant joint attention, neural networks and social cognition. *Neural Networks*, *23*(8-9), 985-997. doi:10.1016/j.neunet.2010.08.009

Mundy, P., Gwaltney, M., & Henderson, H. (2010). Self-referenced processing, neurodevelopment and joint attention in autism. *Autism*, *14*(5), 408-429. doi:10.1177/1362361310366315

Mundy, P. C. (2016). *Autism and joint attention: Development, neuroscience, and clinical fundamentals*. New York, NY: Guilford Publications.

Mundy, P., Novotny, S., Swain-Lerro, L., McIntyre, N., Zajic, M., & Oswald, T. (2017). Joint-attention and the social phenotype of school-aged children with ASD. *Journal of Autism and Developmental Disorders*, *47*(5), 1423-1435. doi:10.1007/s10803-017-3061-0

Murdock, L. C., Cost, H. C., & Tieso, C. (2007). Measurement of social communication skills of children with autism spectrum disorders during interactions with typical peers. *Focus on Autism and Other Developmental Disabilities*, *22*(3), 160-172. doi:10.1177/10883576070220030301

Murza, K. A., Schwartz, J. B., Hahs-Vaughn, D. L., & Nye, C. (2016). Joint attention interventions for children with autism spectrum disorder: A systematic review and meta-analysis. *International Journal of Language & Communication Disorders*, *51*(3), 236-251. doi:10.1111/1460-6984.12212

Naber, F. B., Swinkels, S. H., Buitelaar, J. K., Dietz, C., Van Daalen, E., Bakermans-Kranenburg, M. J., ... & Van Engeland, H. (2007). Joint attention and attachment in toddlers with autism. *Journal of Abnormal Child Psychology*, *35*(6), 899-911. doi:10.1007/s10802-007-9142-3

National Council for Curriculum and Assessment (1999). *Primary school curriculum*. Dublin: National Council for Curriculum and Assessment.

National Council for Curriculum and Assessment (NCCA). (2007). *Guidelines for teachers of students with general learning disabilities.* Dublin: National Council for Curriculum and Assessment.

National Council for Curriculum and Assessment (2009) *Aistear: The early childhood curriculum framework.* Dublin: National Council for Curriculum and Assessment.

National Council for Curriculum and Assessment (2020). *Draft primary curriculum framework*. Dublin: National Council for Curriculum and Assessment

National Council for Special Education (2011). *Inclusive education framework.* Trim, Co. Meath. National Council for Special Education.

National Council for Special Education (2015). *Supporting students with autism spectrum disorder in schools - NCSE policy advice paper NO. 5.* Trim, Co. Meath: National Council for Special Education.

National Council for Special Education (NCSE) (2019a). *Special classes in primary and post-primary schools academic year 19/20.* Trim, Co. Meath*:* National Council for Special Education. Retrieved from: https://ncse.ie/special-classes

National Council for Special Education (NCSE) (2019b). *NCSE primary CPD programme 2019 – 2020.* Retrieved from: https://www.sess.ie/sess-primary-courses

National Council for Special Education (2019c). *Policy advice on special schools and classes: An inclusive education for an inclusive society?* Trim, Co. Meath: National Council for Special Education.

National Institute for Health and Care Excellence (NICE) in collaboration with the Social Care Institute for Excellence (SCIE) (2013). *Autism: The management and support of children and young people on the autism spectrum*. London: National Institute for Health and Care Excellence.

Nugent, M., Jones, V., McElroy, D., Peelo, M., Thornton, T., & Tierney, T. (2014). Consulting with groups of teachers. Evaluation of a pilot project in Ireland. *Educational Psychology in Practice, 30*(3), 255-271. doi: 10.1080/02667363.2014.919440

O'Donoghue v. The Minister for Health, Minister for Education, Ireland and the Attorney General, *Judgement Delivered by Mr. Justice O'Hanlon on the 27th May, 1993.*

O'Donoghue v. The Minister for Health, Minister for Education, Ireland and the Attorney General, *Judgement Delivered by the Supreme Court on the 6th February 1997.*

Pairman, A., & Terreni, L. (2001). *If the environment is the third teacher what language does she speak*. Wellington: Ministry of Education.

Pallant, J. (2013). *SPSS survival manual*. United Kingdom: McGraw-Hill Education.

Parsons, S., Guldberg, K., MacLeod, A., Jones, G., Prunty, A., and Balfe, T. (2009). *International review of the literature of evidence of best practice provision in the education of persons with autistic spectrum disorders*. Trim, Co. Meath: National Council for Special Education.

Partington, J. W. (2010). *The assessment of basic language and learning skills-revised (ABLLS®-R): An assessment, curriculum guide, and skills tracking system for children with autism or other developmental disabilities*. Pleasant Hill, CA: Behavior Analysts.

Paparella, T., & Freeman, S. F. (2015). Methods to improve joint attention in young children with autism: A review. *Pediatric Health, Medicine and Therapeutics, 6*, 65-78. doi:10.2147/PHMT.S41921

Passenger, T. (2013). Introduction to educational psychology practice. In A. Holliman (Ed.), *The Routledge international companion to educational psychology* (pp. 21-30). Abingdon, Oxon: Routledge.

Pellecchia, M., Connell, J. E., Beidas, R. S., Xie, M., Marcus, S. C., & Mandell, D. S. (2015). Dismantling the active ingredients of an intervention for children with autism. *Journal of Autism and Developmental Disorders*, *45*(9), 2917-2927. doi:10.1007/s10803-015-2455-0

Peters-Scheffer, N., Didden, R.., Korzilius, H., & Sturmey, P. (2011). A meta-analytic study on the effectiveness of comprehensive ABA-based early intervention programs for children with autism spectrum disorders. *Research in Autism Spectrum Disorders 5(*1), 60–69. doi:10.1016/j.rasd.2010.03.011

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: Conceptual

distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health and Mental Health Services Research*, *38*(2), 65-76. doi:10.1007/s10488-010-0319-7

Quill, K. A. (1997). Instructional considerations for young children with autism: The rationale for visually cued instruction. *Journal of Autism and Developmental Disorders*, *27*(6), 697-714. doi:10.1023/A:1025806900162

Ravet, J. (2011). Inclusive/exclusive? Contradictory perspectives on autism and inclusion: The case for an integrative position. *International Journal of Inclusive Education*, 15(6), 667-682. doi:10.1080/13603110903294347

Reszka, S. S., Boyd, B. A., McBee, M., Hume, K. A., & Odom, S. L. (2014). Brief report: Concurrent validity of autism symptom severity measures. *Journal of Autism and Developmental Disorders*, *44*(2), 466-470. doi:10.1007/s10803-013-1879-7

Ring, E., Mhic Mhathúna, M., Moloney, M., Hayes, N., Breathnach, D., Stafford, P., Carswell, D., Keegan, S., Kelleher, C., McCafferty, D., O'Keeffe, A., Leavy, A., Madden, R. and Ozonyia, M. (2016). An examination of concepts of school readiness among parents and educators in Ireland. Dublin: Department of Children and Youth Affairs.

Ring, E., O'Sullivan, L., Ryan, M., & Burke, P. (2018). *A melange or a mosaic of theories? How theoretical perspectives on children's learning and development can inform a responsive pedagogy in a redeveloped primary school curriculum.* Limerick: Mary Immaculate College. Retrieved from: https://dspace.mic.ul.ie/handle/10395/2628

Ring, E., Daly, P., & Wall, E. (2018). *Autism from the inside out: A handbook for parents, early childhood, primary, post-primary and special school settings*. New York, NY: Peter Lang Publishing Group.

Ring, E. (2018). Harnessing the Reggio Emilia concept of the environment as the 'third teacher' for children with Autism Spectrum Difference. In E. Ring, E. Wall, & P. Daly (Eds.), *Autism from the inside out: A handbook for parents, early*

*childhood, primary, post-primary and special school settings* (pp. 181-199). New York, NY: Peter Lang Publishing Group.

Ring, E., O' Sullivan, L., O' Keefe, S., Ferris, F., & Wall, E. (2019). Transforming the lives of early childhood teachers, autistic children and their families: Findings and recommendations from an evaluation of a programme of continuing professional development. *Adult Learner: The Irish Journal of Adult and Community Education*, 118-147.

Robinson, L., Bond, C., & Oldfield, J. (2018). A UK and Ireland survey of educational psychologists' intervention practices for students with autism spectrum disorder. *Educational Psychology in Practice*, *34*(1), 58-72. doi:10.1080/02667363.2017.1391066

Robson, S. (2011). Producing and using video data in the early years: Ethical questions and practical consequences in research with young children. Children & Society, 25(3), 179-189. doi:10.1111/j.1099-0860.2009.00267.x

Rocha, M. L., Schreibman, L., & Stahmer, A. C. (2007). Effectiveness of training parents to teach joint attention in children with autism. *Journal of Early Intervention*, *29*(2), 154-172. doi:10.1177/105381510702900207

Rogers, S. J., & Dawson, G. (2010). *Early Start Denver Model for young children with autism.* New York, NY: The Guilford Press.

Rogers, S.J., Estes, A., & Lord, C. (2012). Effects of a brief Early Start Denver Model (ESDM)-based parent intervention on toddlers at risk for autism spectrum disorders: A randomized controlled trial. *Journal of the American Academy of Child and Adolescence Psychiatry, 51*(10), 1052-1065. doi: 10.1016/j.jaac.2012.08.003

Rotheram-Fuller, E., Kasari, C., Chamberlain, B., & Locke, J. (2010). Social involvement of children with autism spectrum disorders in elementary school classrooms. *Journal of Child Psychology and Psychiatry*, *51*(11), 1227-1234. doi:10.1111/j.1469-7610.2010.02289.x

Sallows, G. O., & Graupner, T. D. (2005). Intensive behavioral treatment for children with autism: Four-year outcome and predictors. *American Journal on Mental*

*Retardation*, *110*(6), 417-438. doi: 10.1352/0895-8017(2005)110[417:IBTFCW]2.0.CO;2

Sam, A., Reszka, S., Odom, S., Hume, K., & Boyd, B. (2015). The use of coding methods to estimate the social behavior directed toward peers and adults of preschoolers with ASD in TEACCH, LEAP, and eclectic "BAU" classrooms. *Behavioral Disorders*, *40*(2), 91-101. doi:10.17988/BD-13-47.1

Schertz, H. H., & Odom, S. L. (2004). Joint attention and early intervention with autism: A conceptual framework and promising approaches. *Journal of Early Intervention*, *27*(1), 42-54. doi:10.1177/105381510402700104

Schertz, H. H., & Odom, S. L. (2007). Promoting joint attention in toddlers with autism: A parent-mediated developmental model. *Journal of Autism and Developmental Disorders*, *37*(8), 1562-1575. doi:10.1007/s10803-006-0290-z

Schertz, H. H., Odom, S. L., Baggett, K. M., & Sideris, J. H. (2013). Effects of joint attention mediated learning for toddlers with autism spectrum disorders: An initial randomized controlled study. *Early Childhood Research Quarterly*, *28*(2), 249-258. doi:10.1016/j.ecresq.2012.06.006

Schreibman, L., Dawson, G., Stahmer, A. C., Landa, R., Rogers, S. J., McGee, G. G., ... & McNerney, E. (2015). Naturalistic developmental behavioral interventions: Empirically validated treatments for autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *45*(8), 2411-2428. doi:10.1007/s10803-015-2407-8

Shapiro, D. A. (1996). "Validated" treatments and evidence-based psychological services. *Clinical Psychology: Science and Practice*, *3*(3), 256-259. doi: 10.1111/j.1468-2850.1996.tb00079.x

Shire, S. Y., Goods, K., Shih, W., Distefano, C., Kaiser, A., Wright, C., ... & Kasari, C. (2015). Parents' adoption of social communication intervention strategies: Families including children with autism spectrum disorder who are minimally verbal. *Journal of Autism and Developmental Disorders*, *45*(6), 1712-1724. doi:10.1007/s10803-014-2329-x

Sigman, M., & Mundy, P. (1989). Social attachments in autistic children. *Journal of the American Academy of Child & Adolescent Psychiatry*, *28*(1), 74-81. doi: 10.1097/00004583-198901000-00014

Sigman, M., & Capps, L. (1997). *Children with autism: A developmental perspective (Vol. 34).* Cambridge, MA; London: Harvard University Press.

Sigman, M., Ruskin, E., Arbelle, S., Corona, R., Dissanayake, C., Espinosa, M., ... & Robinson, B. F. (1999). Continuity and change in the social competence of children with autism, Down syndrome, and developmental delays. *Monographs of the Society for Research in Child Development*, i-139.

Sinnott v. Minister for Education, Ireland and the Attorney General, *Judgement Delivered by Mr. Justice Barr on the 4th day of October, 2000.*

Sinnott v. Minister for Education, Ireland and the Attorney General, *Judgement Delivered by Justices Murphy, Hardiman, Murray, Keane, Geoghegan, Denham and Fennelly on the 12th day of July 2001*.

Slavin, R. E. (2002). Evidence-based education policies: Transforming educational practice and research. *Educational Researcher, 31*(7), 15-21. doi:10.3102/0013189X031007015

Smith, T. (2001). Discrete trial training in the treatment of autism. *Focus on Autism and other Developmental Disabilities*, *16*(2), 86-92. doi:10.1177/108835760101600204

Sparapani, N., Morgan, L., Reinhardt, V. P., Schatschneider, C., & Wetherby, A. M. (2016). Evaluation of classroom active engagement in elementary students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *46*(3), 782-796. doi:10.1007/s10803-015-2615-2

Spring, B. (2007). Evidence-based practice in clinical psychology: What it is, why it matters; what you need to know. *Journal of Clinical Psychology*, *63*(7), 611-631. doi:10.1002/jclp.20373

Srivastava, A. K., & Schwartz, C. E. (2014). Intellectual disability and autism spectrum disorders: causal genes and molecular mechanisms. *Neuroscience & Biobehavioral Reviews*, *46*, 161-174. doi:10.1016/j.neubiorev.2014.02.015

Stahmer, A. C., Dababnah, S., & Rieth, S. R. (2019). Considerations in implementing evidence-based early autism spectrum disorder interventions in community settings. *Pediatric Medicine 2(*18), 1-10. doi: 10.21037/pm.2019.05.01

Strong-Wilson, T., & Ellis, J. (2007). Children and place: Reggio Emilia's environment as third teacher. *Theory into Practice*, *46*(1), 40-47. doi: 10.1080/00405840709336547

Stufflebeam, D. L. (1983). The CIPP model for program evaluation. In G.F. Madaus, M. Scriven, & D.L. Stufflebeam (Eds.), *Evaluation models* (pp. 117-142). Boston: Kluwer-Nijhoff.

Stufflebeam, D. L., Madaus, G. F., & Kellaghan, T. (2000). *Evaluation models: Viewpoints on educational and human services evaluation*. Boston: Kluwer-Nijhoff.

Sullivan, M., Finelli, J., Marvin, A., Garrett-Mayer, E., Bauman, M., & Landa, R. (2007). Response to joint attention in toddlers at risk for autism spectrum disorder: A prospective study. *Journal of Autism and Developmental Disorders*, *37*(1), 37-48. doi:10.1007/s10803-006-0335-3

Sundberg, M. L. (2008). *VB-MAPP: Verbal behavior milestones assessment and placement program: A language and social skills assessment program for children with autism or other developmental disabilities.* Concord, CA: AVB Press.

Suter, W. N. (2011). *Introduction to educational research: A critical thinking approach*. California: Sage Publications.

Sutera, S., Pandey, J., Esser, E. L., Rosenthal, M. A., Wilson, L. B., Barton, M., ... & Fein, D. (2007). Predictors of optimal outcome in toddlers diagnosed with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *37*(1), 98-107. doi:10.1007/s10803-006-0340-6

Sutton, B. M., Webster, A. A., & Westerveld, M. F. (2019). A systematic review of school-based interventions targeting social communication behaviors for students with autism. *Autism*, *23*(2), 274-286. doi:10.1177/1362361317753564

Tager-Flusberg, H., & Kasari, C. (2013). Minimally verbal school-aged children with autism spectrum disorder: The neglected end of the spectrum. *Autism Research*, *6*(6), 468-478. doi:10.1002/aur.1329

Taylor, B. A., & Hoch, H. (2008). Teaching children with autism to respond to and initiate bids for joint attention. *Journal of Applied Behavior Analysis*, *41*(3), 377-391. doi:10.1901/jaba.2008.41-377

Tesfaye, R., Courchesne, V., Yusuf, A., Savion-Lemieux, T., Singh, I., Shikako-Thomas, K., ... & Szatmari, P. (2019). Assuming ability of youth with autism: Synthesis of methods capturing the first-person perspectives of children and youth with disabilities. *Autism*, *23*(8), 1882-1896. doi:10.1177/1362361319831487

Toth, K., Munson, J., Meltzoff, A. N., & Dawson, G. (2006). Early predictors of communication development in young children with autism spectrum disorder: Joint attention, imitation, and toy play. *Journal of Autism and Developmental Disorders*, *36*(8), 993-1005. doi:10.1007/s10803-006-0137-7

Torbay Council Children's Services (2020). *Attention Autism*. Retrieved from: https://search3.openobjects.com/mediamanager/torbay/enterprise/files/attention_autism_with_tc_format.pdf

United Nations (UN) (1989) *United Nations Convention on the Rights of the Child.* Geneva: Office of the High Commissioner for Human Rights.

Venter, E., & Buys, E. (2016). Evidence-based assessment-the answer to challenges of assessment in educational psychology practice in diverse societies? *Journal of Psychology*, *7*(2), 77-85. doi: 10.1080/09764224.2016.11907847

Vismara, L. A., Colombi, C., & Rogers, S. J. (2009). Can one hour per week of therapy lead to lasting changes in young children with autism? *Autism*, *13*(1), 93-115. doi:10.1177/1362361307098516

Vygotsky, L. S. (1962). *Thought and language*. Cambridge, Massachusetts: MIT Press.

Vygotsky, L. (1978). Interaction between learning and development. *Readings on the Development of Children*, *23*(3), 34-41.

Ware, J., Balfe, T., Butler, C., Day, T., Dupont, M., Harten, C., ... & Travers, J. (2009). *Research report on the role of special schools and classes in Ireland*. Trim, Co. Meath: National Council for Special Education.

Watson, L. R., Boyd, B. A., Baraneck, G. T., Crais, E. R., & Odom, S. L. (2011). *Advancing Social-Communication and Play (ASAP): An intervention program for pre-schoolers with autism.* Chapel Hill, NC: University of North Carolina at Chapel Hill.

Werling, D. M., & Geschwind, D. H. (2013). Sex differences in autism spectrum disorders. *Current Opinion in Neurology*, *26*(2), 146-153. doi: 10.1097/WCO.0b013e32835ee548

Whalen, C., & Schreibman, L. (2003). Joint attention training for children with autism using behavior modification procedures. *Journal of Child Psychology and Psychiatry*, *44*(3), 456-468. doi:10.1111/1469-7610.00135

Whalen, C., Schreibman, L., & Ingersoll, B. (2006). The collateral effects of joint attention training on social initiations, positive affect, imitation, and spontaneous speech for young children with autism. *Journal of Autism and Developmental Disorders*, *36*(5), 655-664. doi:10.1007/s10803-006-0108-z

White, P. J., O'Reilly, M., Streusand, W., Levine, A., Sigafoos, J., Lancioni, G., Fragale, C., Pierce, N., & Aguilar, J. (2011). Best practices for teaching joint attention: A systematic review of the intervention literature. *Research in Autism Spectrum Disorders*, *5*(4), 1283-1295. doi:10.1016/j.rasd.2011.02.003

Whyte, J. (2005). *Research with children with disabilities: Guidelines and checklist for good practice*. Dublin: Children's Research Centre, Trinity College.

Wong, C. S., Kasari, C., Freeman, S., & Paparella, T. (2007). The acquisition and generalization of joint attention and symbolic play skills in young children with autism. *Research and Practice for Persons with Severe Disabilities*, *32*(2), 101-109. doi:10.2511/rpsd.32.2.101

Wong, C., & Kasari, C. (2012). Play and joint attention of children with autism in the preschool special education classroom. *Journal of Autism and Developmental Disorders*, *42*(10), 2152-2161. doi:10.1007/s10803-012-1467-2

Wong, C. S. (2013). A play and joint attention intervention for teachers of young children with autism: A randomized controlled pilot study. *Autism, 17*(3), 340-357. doi:10.1177/1362361312474723

Wong, C., Odom, S. L., Hume, K. A., Cox, A. W., Fettig, A., Kucharczyk, S., ... Schultz, T. R. (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder: A comprehensive review. *Journal of Autism and Developmental Disorders, 45*(7), 1951-1966. doi:10.1007/s10803-014-2351-z

World Health Organization. (2004). *Manual of the international statistical classification of diseases, injuries and causes of death* (10th ed.). Geneva, Switzerland: World Health Organisation.

# Appendices

## Appendix A - Excluded Studies and Rationale

Table 18

*Excluded studies and rationale*

| **Excluded Studies** | **Code and reason for exclusion** |
|---|---|
| Caballero, A., & Connell, J. E. (2010). Evaluation of the effects of social cue cards for preschool age children with autism spectrum disorders (ASD). *Journal of Behavior Assessment and intervention in Children*, *1*(1), 25. | 5 |
| Duff, C. K., & Flattery, J. J. (2014). Developing mirror self-awareness in students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *44*(5), 1027-1038. | 5 |
| Einfeld, S. L., Beaumont, R., Clark, T., Clarke, K. S., Costley, D., Gray, K. Horstead, S., Hodge, M., Roberts, J., Sofronoff, K., & Taffe, J. R. (2018). School-based social skills training for young people with autism spectrum disorders. *Journal of Intellectual & Developmental Disability*, *43*(1), 29-39. | 5 |
| Ganz, J. B., Bourgeois, B. C., Flores, M. M., & Campos, B. A. (2008). Implementing visually cued imitation training with children with autism spectrum disorders and developmental delays. *Journal of Positive Behavior Interventions*, *10*(1), 56-66. | 5 |
| Ingersoll, B. (2007). Teaching imitation to children with autism: A focus on social reciprocity. *The Journal of Speech and Language Pathology–Applied Behavior Analysis*, *2*(3), 269. | 5 |

Kasari, C., Dean, M., Kretzmann, M., Shih, W., Orlich, F., Whitney, R., Landa, R., Lord, C., & King, B. (2016). Children with autism spectrum disorder and social skills groups at school: A randomized trial comparing intervention approach and peer composition. *Journal of Child Psychology and Psychiatry, 57*(2), 171-179. 5

Rice, L. M., Wall, C. A., Fogel, A., & Shic, F. (2015). Computer-assisted face processing instruction improves emotion recognition, mentalizing, and social skills in students with ASD. *Journal of Autism and Developmental Disorders, 45*(7), 2176-2186. 5

Walberg, J. L., & Craig-Unkefer, L. A. (2010). An examination of the effects of a social communication intervention on the play behaviors of children with autism spectrum disorder. *Education and Training in Autism and Developmental Disabilities*, 69-80. 5

Wilson, K. P. (2013). Incorporating video modelling into a school-based intervention for students with autism spectrum disorders. *Language, Speech, and Hearing Services in Schools*. 5

# Appendix B - Weight of Evidence Ratings

## Methodological Quality- Weight of Evidence A

The six studies were appraised in terms of their methodological quality using a coding protocol from Gersten et al. (2005). This assesses the quality of the studies' methodology to meet the purpose of the study and the current review question regarding the efficacy of school-based joint attention interventions. In order for studies to be rated highly in terms of methodological quality, Table 19 below outlines the primary quality indicators studies were expected to possess. Table 20 provides an overview of each quality indicator and the criteria used. Overall, studies possessed the essential quality indicators outlined by the coding protocol adopted (Gersten et al., 2005).

Table 19

*Primary Quality Indicators (Gersten et al., 2005)*

| Quality Indicators (Gersten et al., 2005) |
| --- |
| • Study gives clear description of participants |
| • Intervention used is described with replicable precision |
| • Implementation of intervention evaluated and reported |
| • Study uses multiple methods to assess participants prior to and after intervention |
| • Study reports the reliability of the outcome measures calculated |

Table 20

*WoE A Weighting Criteria: Description of Participants (Gersten et al., 2005)*

| Rating | Description of rating |
|---|---|
| High (3) | • Appropriate procedures used to ensure that participants are comparable across intervention conditions.<br>• Sufficient information be provided to determine and/or or confirm whether the participants demonstrated the disability/difficulties presented?<br>• Appropriate procedures used to increase the probability that teachers or interventionists will be comparable across conditions? |
| Medium (2) | • Some information given regarding the disability/difficulties of participants presented.<br>• Measures taken to ensure participants are comparable across conditions. |
| Low (1) | • Insufficient information given regarding the disability/ difficulties of the participants. |
| (0) | • None of the criteria were met. |

*WoE A Weighting Criteria: Implementation of the Intervention & Description of Comparison Conditions (Gersten et al., 2005).*

| Weighting | Criteria |
|---|---|
| High (3) | • Intervention clearly described & specified.<br>• Fidelity of intervention described and assessed.<br>• Nature of services provided in comparison condition described. |
| Medium (2) | • Intervention clearly described.<br>• Fidelity of intervention described and assessed.<br>• Little detail of services provided in comparison condition. |
| Low (1) | • Intervention described<br>• Fidelity of intervention not stated. |
| (0) | None of the criteria were met. |

*WoE A Weighting Criteria: Outcome Measures (Gersten et al., 2005)*

| Weighting | Criteria |
|---|---|
| High (3) | • Multiple measures used to provide appropriate balance between measures closely aligned with intervention and measures of generalised performance.<br>• Outcomes for capturing the intervention effect measured at appropriate times.<br>• Data are collected on the reliability or interobserver agreement associated with each dependent variable, and lOA levels meet minimal standards {e.g., lOA = 80%; Kappa = 60%) |
| Medium (2) | Two out of the three above mentioned criteria were met. |
| Low (1) | One of the above criteria were met. |
| (0) | None of the criteria were met. |

The highest possible score per category is 3. The maximum possible score across the 3 subsets is 9. Therefore to attain an average of 3, the scores for each of the three components of Gersten et al. (2005) coding protocol will be added together and divided by 3.

**Weight of Evidence B**

Table 21

*WoE B Criteria*

| Weighting | Criteria |
|---|---|
| High (3) | Random assignment to groups<br>Control group<br>Pre and post intervention data collection<br>Follow up data |
| Medium (2) | Random assignment to groups<br>Control Group<br>Pre and post data collected |
| Low (1) | Control group<br>Pre and post data collected |

Table 22

*WoE C Topic Relevance*

| Weighting | Criteria |
|---|---|
| High (3) | • Participants have a clinical diagnosis of ASD<br>• Joint attention is the primary outcomes of the intervention<br>• Intervention is delivered in school, as part of the curriculum, by class teachers<br>• Intervention is described in enough detail to allow for replication |
| Medium (2) | • Participants have a diagnosis of ASD<br>• Joint attention is one of the primary outcomes of the intervention.<br>• Intervention is delivered in school by trained researcher<br>• Intervention is explained clearly |
| Low (1) | • Participants have a diagnosis of ASD.<br>• Joint attention is a secondary outcomes.<br>• Intervention is delivered in school by paraprofessionals. |

Appendix C - Teacher Information Letter and Consent Form

**RE: Evaluation of the effectiveness of the Attention Autism intervention on the joint attention behaviours of autistic children in Ireland**

**What is the project about?**

This research is in the area of joint attention. Joint attention is the ability to synchronise attention between people and objects. This is a skill that children with ASD have difficulty with and can be a reason for the social communication difficulties observed in children with ASD. This study aims to evaluate the effectiveness of the Attention Autism intervention at improving the joint attention abilities of children with ASD.

**Who is undertaking it?**

My name is Niamh Moore and I am presently completing a Doctorate in Educational and Child Psychology in Mary Immaculate College under the supervision of Professor Emer Ring and Dr. Lisha O'Sullivan. As part of this, I am required to carry out a piece of research in the area of Educational Psychology.

**What are the benefits of this research?**

It is hoped that the data collected will a) foster teacher knowledge in the area of joint attention and may have implications for how we approach teaching children with ASD in the early intervention class setting; b) contribute to the research base of Attention Autism. Your participation in the research would be greatly appreciated and would considerably enhance this research project.

**Exactly what is involved for the participant (time, location, etc.)**

The research project would involve you implementing the Attention Autism intervention for at least three days a week for six weeks in your classroom. I will visit your classroom five times during the research process.

**Visit one**: I will meet each individual child in your class individually and carry out a brief social-communication assessment to identify their current joint attention abilities.

**Visit two:** Video observation of an Attention Autism lesson, and a structured teacher led lesson (e.g. circle time). This will be to assess the children's level of joint engagement during the aforementioned activities.

**Visit three:** I will attend an Attention Autism group to monitor progress and check in.

**Visit four:** Following six weeks intervention the social-communication assessment will be re-administered to each child to assess for changes in joint attention behaviours.

**Visit five:** Video observation of an Attention Autism lesson, and a structured teacher led lesson (e.g. circle time). This will be to assess if there is a change in the children's level of engagement during the aforementioned activities.

**How will confidentiality be kept?**

Electronic and written information will be kept strictly confidential, subject to the limitations of the law, and will be available only to the researcher and supervisors. Excerpts from the data collected during the research process may be used in the results section of my thesis, but under no circumstances will the name of the school or any identifying characteristics be included. Data collected for the research will be stored securely on a password protected computer and in locked cabinets. In accordance with Mary Immaculate

College's Record Retention Schedule all anonymized research data will be retained indefinitely. Data may be used in an anonymous form in any publications that arise from this research.

If you feel you would be happy to participate in this research, I would be grateful if you would sign the attached consent form. In the meantime please do not hesitate to contact me (0872173739, 09006468@micstudent.mic.ul.ie) if you have any queries.

The research study has received Ethics approval from the Mary Immaculate College Research Ethics Committee (MIREC). If you have any concerns about this study and wish to contact an independent authority, you may contact: Mary Collins**,** MIREC Administrator Research and Graduate School**,** Mary Immaculate College**,** South Circular Road**,** Limerick. Telephone: 061-204980/Email: mirec@mic.ul.ie

**Name:** _____

**School:** _____

**RE: An evaluation of the effectiveness of the Attention Autism intervention on the joint attention behaviours of autistic children in Ireland**

Dear Teacher,

As outlined in the information letter the current study aims to evaluate the effectiveness of the Attention Autism intervention on the joint attention behaviours of children. The participant information letter should be read fully and carefully before consenting to take part in the study.

1. Your anonymity is assured and you are free to withdraw from the study at any time. All information gathered will remain confidential and will not be released to any third party. In accordance with the MIC Record Retention Schedule, anonymised research data may be held indefinitely or as required by the researcher.
2. Please read the following statements before signing the consent form:

- I have read and understood the information letter.
- I understand what the project is about, and what the results will be used for.
- I am fully aware of all of the procedures involving myself, and the children in the class I am currently responsible for and of any risks and benefits associated with the study.
- I know that my participation is voluntary and that I can withdraw from the project at any stage without giving any reason and without consequence.
- I understand that the researcher must make five visits to my classroom.
- I understand that two of those visits require the use of video equipment and children in my classroom will be filmed.
- I understand that I may also be filmed during periods of observation.
- I am aware that the results will be kept confidential

Name (PRINTED): _____

Name (SIGNED) _____

Appendix D - Parent Information Letter and Consent Form

**RE: An evaluation of the effectiveness of the Attention Autism intervention on the joint attention behaviours of autistic children in Ireland**

Dear Parent/Guardian,

**What is the project about?**

This research is in the area of joint attention. Joint attention is the ability to synchronise attention between people and objects. This is a skill that children with ASD have difficulty with and can be a reason for the social-communication difficulties observed in children with ASD. This study aims to evaluate the effectiveness of the Attention Autism intervention at improving the joint attention abilities of children with ASD.

**Who is undertaking it?**

My name is Niamh Moore and I am presently completing a Doctorate in Educational and Child Psychology in Mary Immaculate College under the supervision of Professor Emer Ring and Dr. Lisha O'Sullivan. As part of this, I am required to carry out a piece of research in the area of Educational Psychology.

**What are the benefits of this research?**

It is hoped that the data collected will a) foster teacher knowledge in the area of joint attention and may have implications for how we approach teaching children with ASD in the ASD class setting; b) contribute to the research base of Attention Autism. Your participation in the research would be greatly appreciated and would considerably enhance this research project.

**Exactly what is involved for the participant (time, location, etc.)**

The research process will involve five school visits.

**Visit one:** I will meet your child's teacher and discuss the composition of their class. I will be asking the teacher questions about your child which involve asking about your child's diagnosis, their learning abilities and their strengths.

**Visit two:** I will meet with your child and carry out a brief social-communication assessment to identify their current joint attention abilities. This assessment will last 15-20 minutes and will be video recorded.

**Visit three:** Video observation of an Attention Autism lesson (20 minutes), and a structured teacher led lesson (e.g. circle time). This will be to assess the children's level of joint engagement during the aforementioned activities. It will be necessary to video-record children to ensure that all of the information is retained and allows for more accurate observation.

**Visit four:** I will observe the Attention Autism group once during week 3 and week 6.

**Visit five:** Following six weeks intervention the social-communication assessment will be re-administered to assess for changes in joint attention behaviours. Video observation of an Attention Autism lesson (20 minutes), and a structured teacher led

lesson (e.g. circle time) will be carried out. This will be to assess if there is a change in the children's level of engagement during the aforementioned activities.

**How will confidentiality be kept?**

Electronic and written information will be kept strictly confidential, subject to the limitations of the law, and will be available only to the research team. The videos will not be shared with any other party except for my college supervisor and another Doctorate student who will be supporting me with the interpretation.

Your child's anonymity is assured and you and your child are free to withdraw from the study at any time. All information gathered will remain confidential and will not be released to any third party. In accordance with the MIC Record Retention Schedule all anonymized data may be stored indefinitely. You are entitled to request a copy of the video data I collect on your child but it will be altered to protect the anonymity of others who may also be in the recording. Excerpts from the data collected during the research process may be used in the final report, but under no circumstances will your child's name or any identifying characteristics be included.

If you are interested in having your child participate in the research project, I would be grateful if you would sign the attached consent form. Following receipt of these forms, I will begin collecting data in your child's classroom. In the meantime please do not hesitate to contact me (0872173739, 09006468@micstudent.mic.ul.ie). You may also contact my supervisor Professor Emer Ring (emer.ring@mic.ul.ie) if you have any queries. This research study has received Ethics approval from the Mary Immaculate College Research Ethics Committee (MIREC). If you have any concerns about this study and wish to contact an independent authority, you may contact: Mary Collins, MIREC Administrator, Research and Graduate School, Mary Immaculate College, South Circular Road, Limerick. Telephone: 061-204980/E-mail: mirec@mic.ul.ie.

Yours Sincerely,

_____

Niamh Moore

**RE: An evaluation of the effectiveness of the Attention Autism intervention on the joint attention behaviours of autistic children in Ireland**

Dear Parent/Guardian,
As outlined in the information letter the current study will evaluate the effectiveness of the Attention Autism intervention on the joint attention skills of children with ASD. The participant information letter should be read fully and carefully before consenting to your child participating in the study.

Please read the following statements before signing the consent form.

- I have read and understood the information letter.
- I am aware that the researcher will be asking my child's teacher question about my child regarding their diagnosis and learning ability.
- I understand that all information regarding my child will be anonymized and kept confidential.
- I understand that this anonymized research data may be held indefinitely or as required by the researcher.
- I understand what the project is about, and what the results will be used for.
- I am fully aware of all of the procedures involving my child and of any risks and benefits associated with the study.
- I know that my participation and my child's participation is voluntary and that I can withdraw from the project at any stage without giving any reason and without consequence.
- I understand that the researcher must make five visits to my child's classroom.
- I understand that two of those visits require the use of video equipment and my child will be filmed.
- I am aware that I do not have to give consent for my child to participate in the research and my decision will not be questioned and will be without consequence.
- I am aware that my child's recordings may be shared with the researcher's supervisors and Doctorate student but that the researcher will be the only one to keep a copy.
- I am aware that I can request a copy of the video data taken of my child but it will be altered so that other children/staff are not identifiable.

**Name of child** _____

**School** _____

**Parent signature** _____

**Date** _____

Appendix E - Child Assent

**My name is Niamh. I go to school here.**

**I am making a video for my school on your classroom.**

**I would like to video how you work and how you play.**


**If, you want me to stop videoing you, that's ok.**

**Just tell me or give me the stop card.**


**Name: _____**

**I am happy for you to watch me at school today?**

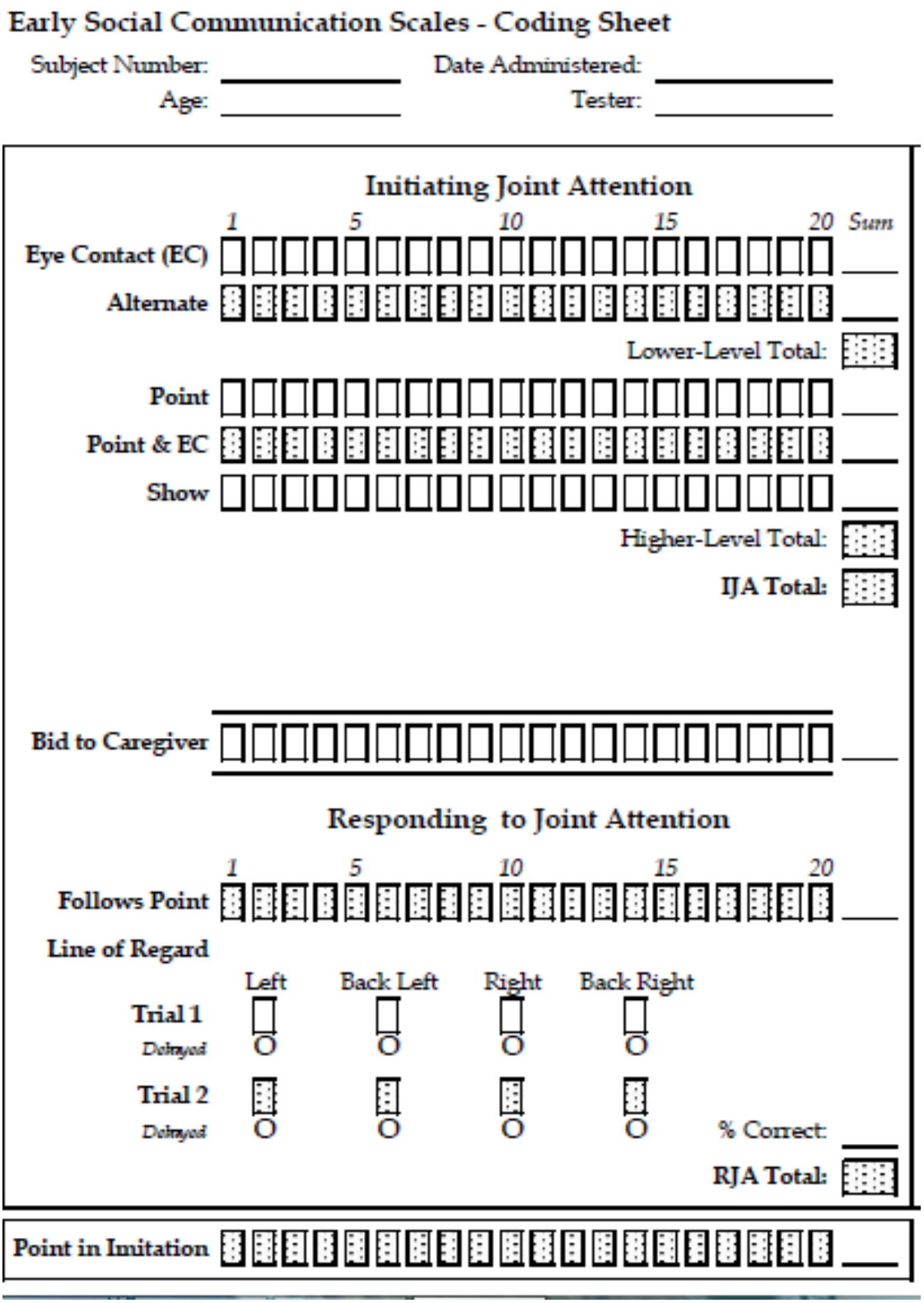
Appendix F - Code Summary (ESCS)

| **Behaviour** | **Level** | **Code** | **Tasks** | **Description** |
|---|---|---|---|---|
| IJA | Lower | Eye Contact | Object Spectacle | -Child makes EC with tester while manipulating or touching an inactive mechanical toy<br>-Do not code EC elicited by movement or noise made by the tester |
| IJA | Lower | Alternates (references) | Object Spectacle | -Child alternates a look between an active object spectacle and the tester's eyes<br>-Typically when an object is active on the table or in the tester's hands but also recorded if child looks up to tester after an object becomes active in own hands |
| IJA | Higher | Points | Object Spectacle; Book | Before tester has pointed:<br>-Child points to an active toy<br>OR<br>-Child points to pictures in book<br>OR<br>-Child points to wall posters<br>-May occur with or without eye contact |

| | | | | |
|---|---|---|---|---|
| IJA | Higher | Show | Object Spectacle | -Child raises a toy upward towards tester's face<br>-Typically brief bids with child quickly retracting the proffered object<br>-May be difficult to distinguish from give (IBR)- if child resists when tester attempts to retrieve object coded as Show |
| RJA | Lower | Following proximal point/touch | Book | -Tester points to 6 pictures<br>-Credit given if he/she orients head and eyes to picture |
| RJA | Higher | Following line of regard | Look | - For left and right trials: child receives credit if they turn eyes or head sufficiently to indicate they are looking in correct direction AND **beyond end of tester's index finger**<br>- For behind trials: child receives credit if they display a head turn of >90 degrees to indicate looking in |

| | | | | |
|---|---|---|---|---|
| | | | | general vicinity behind the child<br>- A definitive head turn is necessary in cases where the tester's index finger is not observable |

Appendix G - ESCS Coding Sheet



Early Social Communication Scales - Coding Sheet

Subject Number: _____ Date Administered: _____

Age: _____ Tester: _____

Initiating Joint Attention

1 5 10 15 20 Sum

Eye Contact (EC) _____

Alternate _____

Lower-Level Total:

Point _____

Point & EC _____

Show _____

Higher-Level Total:

IJA Total:

Bid to Caregiver _____

Responding to Joint Attention

1 5 10 15 20

Follows Point _____

Line of Regard

| | Left | Back Left | Right | Back Right |
|---|---|---|---|---|
| Trial 1 | | | | |
| Delayed | O | O | O | O |
| Trial 2 | | | | |
| Delayed | O | O | O | O |

% Correct: _____

RJA Total:

Point in Imitation _____

Appendix H - Codebook for Classroom Observations

| **Behaviour** | **Definition** |
|---|---|
| Engagement states | (adapted from Adamson et al. 2004) |
| Unengaged | The child appears uninvolved with teacher, object, or activity. He or she may be scanning the room as if looking for something to do.<br>He/ She may be engaged with an irrelevant object or event in their environment<br>It is clear that they are not sharing the attention of their peers or teacher |
| Supported joint engagement | The child and teacher are actively involved with the same object or event but the child is making no overt acknowledgement of the teacher's participation |
| Coordinated joint engagement | The child and teacher are actively involved with the same object or event, and the child is actively and repeatedly acknowledging the teacher's participation. |
| Joint attention | (adapted from Wong & Kasari, 2012) |
| RJA | The child responds (attentional or behavioural) to another's bid (show or point to an object) for joint attention |
| IJA | The child initiates (alternates eye gaze, show or point) a bid for joint attention |

## Appendix I - Time Sampling Record Sheet

ID: Group: Intervention / Control Time: Pre / Post AA / CT

| | Unengaged | Time | Supported JE | Time | Co-ordinated JE | Time | RJA | IJA |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| Total | | | | | | | | |

## Appendix J - Coding of Video Data

### Joint Attention during the Early Social Communication Scales

The researcher studied the coding manual provided in the ESCS (Mundy et al., 2003) prior to coding, and became familiar with the definitions of behaviours. Appendix F provides a summary of the IJA and RJA behaviours the researcher coded for during the semi-structured assessment. The researcher used the coding sheets within the ESCS to compute the frequency of these behaviours (Appendix G).

### Joint Attention in the Group Setting

Preceding research has found brief interventions to have a non-significant effect on joint attention behaviours in the ESCS (Chang et al., 2016). The presence of an unfamiliar tester being a potential explanation for this (Kaale et al., 2012). As this research is concerned with the need to evaluate interventions in the naturalistic setting and provide evidence regarding the clinical utility of the intervention, it was decided that the researcher would record the frequency of RJA and IJA behaviours during naturalistic group settings in addition to the ESCS. The definitions of RJA and IJA used in classroom-based research by Wong and Kasari (2012) were adopted for this. These definitions can be found in Appendix H. The researcher recorded instances of IJA and RJA during the video-recorded group sessions for each of the participating children. These frequencies were tallied using the coding sheet in Appendix I and compared pre- and post-intervention.

### Interrater Reliability

Parents were made aware of another student watching the videos in the information letter (Appendix D). The independent coder watched the videos on the researcher's laptop and did not have access to the video data after the coding was complete. In order to ensure inter-rater reliability, 20% of ESCS videos ($n$ = 8) were coded by a peer on the Doctorate programme. The researcher randomly chose two pre-intervention ESCS videos from the intervention group, and two from the control group. Similarly, two post-intervention ESCS videos from the intervention group and two from the control group were coded by the independent Doctorate student. They were provided with a coding manual and coding sheets. The scores of the independent coder were

entered into SPSS and compared to the scores of the primary researcher. An intraclass correlation coefficient was subsequently calculated.

**Joint Engagement in the Group Setting**

This study sought to investigate the impact of the Attention Autism intervention on the joint engagement of autistic children during a teacher led group. Following the formulation of research questions and choosing of methodology, the researcher created a codebook to analyse the video data. These codes were adapted from those provided by Adamson et al. (2004). Appendix H provides details of these codes.

**Coding of Joint Engagement**

In order to measure joint engagement, the researcher used video data of children in their naturalistic classroom groups to identify the percentage of time children spent in an unengaged, supported joint engagement, and coordinated joint engagement state pre- to post-intervention. Video data were collected of participating children in the intervention group during circle time and Attention Autism pre and post. Video data of children in the control group during circle time were collected pre and post. Each video was ten minutes in length. Time sampling was used to identify the time children spent in each engagement state during the teacher led groups and during the Attention Autism group.

Firstly, the researcher created a time sampling record sheet, this template is provided in Appendix I. Next the researcher watched each group video multiple times focussing on one individual child each time. For example, in a classroom with six participating children, the group video was watched six times, focussing on one individual child each time. The researcher watched the video noting the onset and offset times for each engagement state for each child. At the end of the ten-minute video, the researcher summed the total duration in seconds each child spent in each engagement state. This data was then used to compute the percentage of time children spent in each state. This was done by dividing the total number of seconds the child spent in each engagement state by the total length of the observation in seconds (600) and multiplying by one hundred.

**Interrater Reliability**

In order to ensure inter-rater reliability, 20% of group videos ($n$ = 8) were coded by a peer on the Doctorate programme, who had prior experience with time sampling as a method of observation. The researcher randomly chose two pre-intervention Attention Autism and circle time videos from the intervention group and two circle time videos from the control group. Similarly, two post-intervention Attention Autism and circle time videos from the intervention group and two circle time videos from the control group were coded by the independent Doctorate student. Similar to the coding of the ESCS, the independent coder watched the videos on the researcher's laptop and did not have access to the video data after the coding was complete. The codebook in Appendix H and the coding sheet in Appendix I were given to the independent coder. The scores of the independent coder were entered into SPSS and compared to the scores of the primary researcher. An intraclass correlation coefficient was subsequently calculated.

## Appendix K - Sample of ESCS Coding

PRIMARY RESEARCHER

**Early Social Communication Scales - Coding Sheet**

Mundy et al., 2003, University of Miami

Subject Number: WEI02 Date Administered: _____ Date Scored: 15/12/19 Tape Number: _____

Age: _____ Tester: _____ Rater: _____ Counter: _____

**Initiating Joint Attention**

| | 1 5 10 15 20 | Sum |
|---|---|---|
| Eye Contact (EC) | ■■■■ | 4 |
| Alternate | ■ | 1 |
| Lower-Level Total: | | 5 |
| Point | | |
| Point & EC | | |
| Show | | |
| Higher-Level Total: | | 0 |
| IJA Total: | | 5 |

Bid to Caregiver

**Initiating Behavioral Requests**

| | 1 5 10 15 20 | Sum |
|---|---|---|
| Eye Contact (EC) | | |
| Reach | | |
| Appeal | | |
| Lower-Level Total: | | |
| Point | | |
| Point & EC | | |
| Give | | |
| Give & EC | | |
| Higher-Level Total: | | |
| IBR Total: | | |

Bid to Caregiver

**Responding to Joint Attention**

| | 1 5 10 15 20 | |
|---|---|---|
| Follows Point | ■ | 1 |

Line of Regard

| | Left | Back Left | Right | Back Right |
|---|---|---|---|---|
| Trial 1 | | | | |
| Delayed | o | o | o | o |
| Trial 2 | | | | |
| Delayed | o | o | o | o |

% Correct: 0

RJA Total: 1

**Responding to Behavioral Requests**

| | 1 5 10 15 20 |
|---|---|
| Without Gesture Pass | |
| Fail | |
| With Gesture Pass | |
| Fail | |

% Correct: _____

RBR Total: _____

Point in Imitation

Notes:

58

INDEPENDENT CODER

**Early Social Communication Scales - Coding Sheet**

Mundy et al., 2003, University of Miami

Subject Number: WEI02 Date Administered: _____ Date Scored: 02/01/20 Tape Number: _____

Age: _____ Tester: _____ Rater: _____ Counter: _____

**Initiating Joint Attention**

| | 1 5 10 15 20 | Sum |
|---|---|---|
| Eye Contact (EC) | ■■■■ | 4 |
| Alternate | ■ | 1 |
| Lower-Level Total: | | 5 |
| Point | | |
| Point & EC | | |
| Show | | |
| Higher-Level Total: | | 0 |
| IJA Total: | | 5 |

Bid to Caregiver

**Initiating Behavioral Requests**

| | 1 5 10 15 20 | Sum |
|---|---|---|
| Eye Contact (EC) | | |
| Reach | | |
| Appeal | | |
| Lower-Level Total: | | |
| Point | | |
| Point & EC | | |
| Give | | |
| Give & EC | | |
| Higher-Level Total: | | |
| IBR Total: | | |

Bid to Caregiver

**Responding to Joint Attention**

| | 1 5 10 15 20 | |
|---|---|---|
| Follows Point | ■ | 1 |

Line of Regard

| | Left | Back Left | Right | Back Right |
|---|---|---|---|---|
| Trial 1 | | | | |
| Delayed | o | o | o | o |
| Trial 2 | | | | |
| Delayed | o | o | o | o |

% Correct: 0

RJA Total: 1

**Responding to Behavioral Requests**

| | 1 5 10 15 20 |
|---|---|
| Without Gesture Pass | |
| Fail | |
| With Gesture Pass | |
| Fail | |

% Correct: _____

RBR Total: _____

Point in Imitation

Notes:

58

Appendix L - Joint Engagement Coding Sample

PRIMARY RESEARCHER

ID: WE102 Group: Intervention / Control Time: Pre Post AA / CT

| State | Unengaged | Time | Object | Time | Person | Time | Supported JE | Time | Co-ordinated JE | Time | RJA | IJA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0:58 - 1:05 | 7 | 6:51 - 6:59 | 8 | | | 0:15 - 0:58 | 43 | | | | ✓ |
| | 2:16 - 2:23 | 7 | | | | | 1:05 - 2:16 | 71 | | | | |
| | 2:33 - 2:38 | 5 | | | | | 2:23 - 2:33 | 10 | | | | |
| | 5:31 - 5:33 | 2 | | | | | 2:38 - 5:31 | 173 | | | | |
| | | | | | | | 5:33 - 6:51 | 78 | | | | |
| | | | | | | | 6:59 - 7:30 | 31 | | | | |
| | | 21 | | 0 | | | | 324 | | | | |
| Total | 4 | 21 | 1 | 8 | | | 6 | 906 | | | 0 | 1 |

Rate 0.57 0.14 0.86

% 6 90 %

INDEPENDENT CODER

ID: WE102 Group: Intervention / Control Time: Pre / Post AA / CT

| | Unengaged | Time | Object | Time | Supported JE | Time | Co-ordinated JE | Time | RJA | IJA |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0:58 - 1:05 | 7 | 6:51 - 6:59 | 8 | | | 0:15 - 0:58 | 43 | | X |
| 2 | 2:16 - 2:23 | 7 | | | | | 1:05 - 2:16 | 71 | | |
| 3 | 2:33 - 2:40 | 7 | | | | | 2:23 - 2:33 | 10 | | |
| 4 | 5:31 - 5:33 | 2 | | | | | 2:40 - 5:31 | 175 | | |
| 5 | | | | | | | 5:33 - 6:51 | 78 | | |
| 6 | | | | | | | 6:59 - 7:30 | 31 | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| Total | 4 | 23 | 1 | 8 | | | 6 | 408 | | |

## Appendix M - Social Validity Questionnaire

**Demographic information**

□ Female

□ Male

□ Prefer not to say

**How many years teaching experience do you have?**

_____

**How many years have you been teaching in the ASD class setting?**

_____

**How long have you been using Attention Autism?**

_____

**What age group are you currently teaching?**

□3-5 year olds

□5-8 year olds

□9-12 year olds

□Other: _____

**How often do you use Attention Autism?**

□More than once a week over the academic year

□Once a week over the academic year

□More than once a week over one term

□Once a week over one term

□Infrequently

□Other:_____-

**In your opinion what are the advantages of Attention Autism in the classroom? (Tick all that apply)**

□Supports children in learning to share attention with their teacher

□Increases language use

□Increases children's on-task behaviour,

□Improves attention and/or concentration

□ Other:

**What age group have you used Attention Autism with? (Tick all that apply)**

□3-5 year olds

□5-8 year olds

□9-12 year olds

□Other:

**How do you monitor your student's progress with Attention Autism? *Check all that apply.***

□Attention Autism assessment sheets

□Teacher observation records

□Teacher assessment tools

□I do not currently measure outcomes

□Other:

**Do you implement all four stages of Attention Autism?**

□Yes

□No

**If you answered no to the previous question, please outline which stages YOU DO implement? *Check all that apply.***

□Stage one

□Stage two

□Stage three

□Stage four

**What age do you feel Attention Autism is most suitable for? (Tick all that apply)**

| Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**Attention Autism is easy for teachers to implement into their daily routines**

| Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**Children appear to enjoy participating in Attention Autism**

| Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**Attention Autism is cost effective**

| Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**Children generalise skills learnt during Attention Autism lessons to other lessons**

| Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**I would recommend Attention Autism to colleagues**

| Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**I feel confident using Attention Autism**

| Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**Attention Autism is an appropriate intervention for the ASD class setting**

| Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**Attention Autism is a useful and effective ASD intervention**

| Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**How likely would you be to continue using Attention Autism in your classroom?**

| Not at all likely | | | | Extremely likely |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

Appendix N - Implementation Fidelity Checklist

| | |
|---|---|
| Adult leading the group is sitting in front of a blank wall or screen to minimise distractions. | **Yes** ☐ **No** ☐<br>**Comment:** |
| There are no distractions during the group- computers turned off/ 'Do not disturb' sign on the classroom door, switched off the phone, etc. | **Yes** ☐ **No** ☐<br>**Comment:** |
| Pupils are sitting in a semi-circle facing the adult leading the group. | **Yes** ☐ **No** ☐<br>**Comment:** |
| All pupils have a clear view of the activities and are seated at a good distance from the leader. | **Yes** ☐ **No** ☐<br>**Comment:** |
| Session is started by drawing the activities, in order, on a whiteboard and telling the | |

| | |
|---|---|
| group what activities are coming. Whiteboard displayed so they can see it throughout the session. | **Yes** **No**<br>☐ ☐<br>**Comment:** |
| All adults in the room also sit in the semi-circle and watch the activities with the pupils. No adults are engaged in other tasks such as preparing materials, tidying the room etc. | **Yes** **No**<br>☐ ☐<br>**Comment:** |
| The adults are sitting at either end of the semi-circle so that the pupils are all sitting beside each other. However, if there is a pupil who is likely to get off his seat, an adult can be positioned beside him and block him if he tries to leave the group or touch the materials. | **Yes** **No**<br>☐ ☐<br>**Comment:** |
| The adults in the group are modelling the behaviour expected of the pupils i.e. watching with obvious interest and making 'approving' or 'delighted' noises to show they are enjoying the activities. Using a limited amount of language and imitate only what the leader says. No new language should be used. | **Yes** **No**<br>☐ ☐<br>**Comment:** |
| Negative behaviours are ignored. The teacher and SNAs should not make comments such as "Sit down", "Be quiet", "Watch the toys". Instead, the teacher looks at a child who is showing positive behaviours and make comments such as "Good sitting", "Good watching" etc. An | **Yes** **No**<br>☐ ☐<br>**Comment:** |

| | |
|---|---|
| effort is made to praise each child at some point during the group. | |
| Teacher avoids engaging in questions or discussions with the children | **Yes** **No**<br>☐ ☐<br>**Comment:** |
| The amount of language used in the group is limited. Simple words and phrases and only talk about the materials and activities which they are using | **Yes** **No**<br>☐ ☐<br>**Comment:** |
| Children not allowed to touch the materials during earlier stages. | **Yes** **No**<br>☐ ☐<br>**Comment:** |
| Materials are set out and tidied away in front of the children. | **Yes** **No**<br>☐ ☐<br>**Comment:** |

Appendix O - Ethical Approval

MARY IMMACULATE COLLEGE
COLÁISTE MHUIRE GAN SMÁL

## Mary Immaculate College Research Ethics Committee

**MIREC-4:** MIREC Chair Decision Form

APPLICATION NO. A19-030

1. PROJECT TITLE

An evaluation of the effectiveness of the Attention Autism intervention on the joint attention behaviours of preschool children with Autism Spectrum Disorder (ASD) in Ireland

2. APPLICANT

| | |
|---|---|
| Name: | Niamh Moore |
| Department / Centre / Other: | RPECS |
| Position: | Postgraduate Researcher (Doctorate in Education & Child Psychology) |

3. DECISION OF MIREC CHAIR

| | |
|---|---|
| ☐ | Ethical clearance through MIREC is required. |
| ☐ | Ethical clearance through MIREC is not required and therefore the researcher need take no further action in this regard. |
| ✓ | Ethical clearance is required and granted. Referral to MIREC is not necessary. |
| ☐ | Ethical clearance is required but the full MIREC process is not. Ethical clearance is therefore granted if required for external funding applications and the researcher need take no further action in this regard. |
| ☐ | Insufficient information provided by applicant / Amendments required. |

4. REASON(S) FOR DECISION

**A19-030 – Niamh Moore -** ***An evaluation of the effectiveness of the Attention Autism intervention on the joint attention behaviours of preschool children with Autism Spectrum Disorder (ASD) in Ireland***

I have reviewed this application and I believe it satisfies MIREC requirements. It is, therefore, approved.

5. DECLARATION (MIREC CHAIR)

| | |
|---|---|
| Name (Print): | Dr Áine Lawlor |
| Signature: | Áine Lawlor |
| Date: | 18th July 2019 |

MIREC-4 Rev 3 Page 1 of 1