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## Creating Effective and Responsive Early Education Environments for Children with Autism Spectrum Disorder

Elizabeth Aylward

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# **Creating Effective and Responsive Early Education Environments for Children with Autism Spectrum Disorder**

A thesis submitted in fulfilment of the requirements for the award of the degree

**Doctor of Philosophy**

from the

University of Wollongong

by

**Elizabeth Aylward**

M.A. Early Childhood Education

Supervisors:

A/Prof Cathrine Neilsen-Hewett

Professor Marc de Rosnay

University of Wollongong

School of Education

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## Abstract

Having access to effective interventions during the early years is a critical step on the intervention pathway for children with Autism Spectrum Disorder (ASD) enabling developmental progress and improved quality of life (Whitehouse et al., 2020). A review of the wide array of intervention approaches to ASD yields evidence for positive effects on a range of child and family outcomes across different intervention paradigms (Whitehouse et al., 2010). One approach gaining worldwide attention and evidence is the Early Start Denver Model (ESDM). The ESDM is a Naturalistic Developmental Behavioural Intervention (NDBI) for young children aged 12 – 60 months with ASD with demonstrated evidence for its effectiveness when delivered in one-to-one clinical settings and autism-specific group settings by ESDM-certified therapists (Rogers & Dawson, 2010; Eapen et al., 2012; Vivanti et al., 2014). Investigation into the effectiveness of this intervention approach when implemented by regular educators in mainstream early childhood education and care (ECEC) settings, accessed by many young children with ASD, is needed. All three studies and the development of the professional development package contained in this thesis were based on the ESDM.

**Study one** investigated an ESDM approach delivered by (trained) ECEC educators to address maladaptive behaviours in preschool-aged children with ASD. This 11-month intervention, delivered in an Autism specific ECEC with 38 children showed drastic improvements in the reduction of maladaptive behaviours in 79% of the sample. Whilst the initial findings from the quantitative study were very encouraging, the intervention environment was a specialised service rather than a mainstream ECEC service. Nevertheless, the findings presented in Chapter 3 establish that the ESDM approach can be delivered at fidelity by regular educators who have undergone the rigorous training and certification processes in this model.

**Study two** examined the perspectives of parents who have enrolled their child with ASD in mainstream ECEC services in order to embed and consider the parent voice as part of the intervention process. Fifteen families participated in qualitative interviews to ascertain whether or not intervention,

provided in a mainstream ECEC setting was identified as a priority. The findings of these interviews indicated that parents were primarily motivated to enrol their children in mainstream ECECs so they could benefit from social interactions with typically developing peers. Despite reporting on the many challenges they encountered in securing a mainstream ECEC placement for their child, parents were resolute about their child's development being best supported by participating in these services. These parental perspectives and expectations contribute to the importance of understanding the plausibility of embedding the ESDM in mainstream ECECs. However findings demonstrated that the capabilities of their educators need to be comprehensively supported to achieve this effectively.

**Study three** was a direct outcome of studies one and two and investigated the feasibility and outcomes of applying the ESDM to three mainstream ECECs via a professional learning program (PLP) developed specifically for this study – '*One of the Kids*'. The results of this study, derived from pre and post surveys / interviews and fidelity ratings of 53 educators were particularly encouraging as they demonstrated that with a targeted PLP, an evidence-based model of ASD intervention could be successfully applied to mainstream ECECs. Further, by doing this, staff developed the skills and confidence to dismantle the greatest barrier to the inclusion of a child with ASD, which was their maladaptive behaviour.

**Conclusion.** The research presented in this thesis has made an important contribution to the feasibility of embedding evidence-based interventions for children with ASD in the more naturalistic settings of mainstream ECECs in Australia. The findings relating to the design, development and implementation of a targeted PLP illustrate the potential of building educator capacity for the benefit of all parties involved in the inclusion of children with ASD in Australian ECECs. These findings could have worthwhile implications for policy makers in the early childhood sector, with the potential to benefit educators and children with ASD and their families.

## **Statement of Thesis Style**

This thesis has been prepared in journal article compilation style format. A signed thesis style format agreement between the PhD candidate and supervisors can be found in Appendix A

## **Publications Constituting this Thesis**

### **Published Articles**

#### **Chapter 3**

Fulton, E (now Aylward, E.), Eapen, V., Crnčec, R., Walter, A., & Rogers, S. (2014). Reducing maladaptive behaviours in preschool-aged children with autism spectrum disorder using the Early Start Denver Model. *Frontiers in Pediatrics*, 2(40), 1-10.  
<https://doi.org/10.3389/fped.2014.00040>

#### **Chapter 4**

Blackmore, R., Aylward, E., (co-Authors) & Grace, R. (2016). 'One of the Kids': Parent Perceptions of the Developmental Advantages Arising from Inclusion in Mainstream early Childhood Education Services. *Australasian Journal of Early Childhood*, 41(2), 13-17.  
<https://doi.org/10.1177/183693911604100203>

#### **Chapter 6**

Aylward, E., & Neilsen-Hewett, C. (2021). Application of an Evidence-Based Early Intervention Model for Children With ASD in Mainstream Early Childhood Education and Care Settings via a Targeted Professional Development Program. *Australasian Journal of Special and Inclusive Education*, 45(2), 135-149. <https://doi.org/10.1017/jsi.2021.11>

NB: The first published paper and Chapter 3 was published in the candidate's married name (Fulton). The greater part of all work presented in this thesis, including published works and those submitted for publication, is attributed to me, as the PhD candidate. Supervisors and co-authors have enacted their role in the formulation of research aims and ideas and the revision of published and submitted works. All investigations, analyses and reporting have been carried out solely by me, in keeping with the requirements of my candidature. A signed statement of contribution can be found in Appendix B.

## **Contributions Related to this Thesis**

This thesis has made several contributions to Professional Development across the Early Childhood Education and Care Sector and to the NSW Department of Education in the form of 3 Accredited Professional Learning and Mentoring Programs, developed by the PhD candidate.

1. The original version of ‘One of the Kids’ PL was approved by NSW Board of Studies (Bostes) (<https://www.boardofstudies.nsw.edu.au/about/index.html>, 2017) and disseminated by the NSW Department of Education (DoE) across NSW to Educators in services funded by the DoE on a monthly basis.
2. The updated version of ‘One of the Kids’ PL – ‘One for the Team - Early Start Denver Model for Educators including children with ASD in mainstream ECEC settings’ was approved by NSW Education Standards Authority (NESA) 2020 and again in 2022 ([educationstandards.nsw.edu.au](http://educationstandards.nsw.edu.au)) to be delivered across Australia on a quarterly basis to educators in mainstream ECEC settings and is followed up by fortnightly Communities of Practice sessions facilitated by a Certified ESDM Therapist and Educator.
3. An extrapolated version of ‘One for the Team’ was developed for Parents of Children with ASD and is delivered on a monthly basis to a group of 12 parents immediately post diagnosis, to establish a network of parents and to introduce Early Start Denver Model practices that can be carried out at home.

## Acknowledgments

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To KU Children's Services, in particular the amazing educators who so willingly participated in this research, I am enormously grateful. You generously shared your time and happily took a leap of faith with me to train in and implement an evidence-based model of intervention in your services. You all made this research possible and very enjoyable.

To my work colleagues and friends, I thank you for your friendship, support and encouragement throughout this whole process. It has been good to share all of our experiences and always find the smile.

To my parents who absolutely instilled a love of learning and hard work in all of your children, laying the foundation for us all to find great satisfaction in our careers and lives.

To my beautiful children, who have supported my every endeavour and continued the trajectory of a love of learning and strong work ethic, I am so grateful to have had the opportunity share your journeys through life and to join you both in so many happy times still. You are my greatest achievement.



## **Certification**

I, Elizabeth Aylward, declare that this thesis submitted in fulfilment of the requirements for the conferral of the degree Doctor of Philosophy, from the University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. This document has not been submitted for qualifications at any other academic institution.

**Elizabeth Aylward**

27<sup>th</sup> February 2022

## **List of Definitions**

ASD	This is the abbreviated form of Autism Spectrum Disorder, used throughout this thesis and refers to a neurological disorder that significantly impacts an individual's development, learning, adaptive behaviour, and functioning, with particular difficulties in socialization and communication functioning and restricted range of interests and repetitive patterns of behaviour.
Children	In the context of this thesis the children refers to individuals between 12 months and 60 months of age.
Early childhood	This term refers to the period of time from birth to 5 years of age
ECEC	This is the abbreviated form of Early Childhood Education and Care services licensed to provide education and care to children from 6 weeks to 6 years of age.
Educator	In the context of this thesis the term educator is used to refer to all individuals (of any qualification) directly providing education and care to children in early childhood education and care settings.
Professional Learning	In the context of this thesis, professional learning is a process of workshops and mentoring designed to stimulate the thinking and knowledge of educators to ensure their current practice is critically informed and enhanced.
Long-day-care	Centre-based children's service providing education and care to children from 6 weeks to 6 years of age up, typically 8 hours a day over 48 weeks of the year.
Preschool	Centre-based children's service providing education and care to children 3 to 6 years of age and typically operating in adherence with school hours and school holidays.
Preschool children	Children aged between 3 and 6 years.

## **List of Names or Abbreviations**

ABA	Applied Behaviour Analysis
ABS	Australian Bureau of Statistics
ADI-R	Autism Diagnostic Interview-Revised
ADOS	Autism Diagnostic Observation Schedule
APA	American Psychiatric Association
ASD	Autism Spectrum Disorder
ASELCCs	Autism Specific Early Learning and Care Centres
CAP	Comprehensive Autism Program
CDC	Centres for Disease Control and Prevention
CTM	Comprehensive Treatment Model
DEEWR	Department of Education Employment and Workplace Relations
DSM-5	Diagnostic and Statistical manual of Mental Disorders Fifth Edition
DTT	Discrete Trial Training
EBPs	Evidence-Based Practices
ECEC	Early Childhood Education and Care
ECT	Early Childhood Teacher
EIBI	Early Intensive Behavioural Intervention
EMT	Enhanced Milieu Teaching
ESDM	Early Start Denver Model
EYLF	Early Years Learning Framework
FCT	Functional Communication Training
GP	Guided Practice
JASPER	Joint Attention and Symbolic Play Engagement and Regulation
LEAP	Learning Experiences and Alternative Program
MMR	Measles, Mumps, and Rubella
NDBIs	Naturalistic Developmental Behavioural Interventions

NQS	National Quality Standard
NSW	New South Wales
PDD-NOS	Pervasive Developmental Disorder-Not Otherwise Specified
PECS	Picture Exchange Communication System
PLP	Professional Learning Program
PRT	Pivotal Response Training
QA	Quality Area
SCERTS	Social Communication, Emotional Regulation, Transactional Support
TEACH	Treatment and Education of Autistic and Related Communication Handicapped Children program
VOCA	Voice Output Communication Aid

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# Chapter 1: Critical Review

## 1.1 Important background

Over the last two decades the ways in which clinicians, educators and parents respond to children with Autism Spectrum Disorder (ASD) has been rapidly changing. Specifically, the dominance of traditional approaches, such as intensive Applied Behaviour Analysis (ABA), has waned and there is increasing recognition that, for the majority of children with ASD and their families, more naturalistic approaches are appropriate, efficacious and appealing (Whitehouse et al., 2020). Although there is evidence of ABA grounded practices moving toward more naturalistic approaches, the core developmental constructs used in the ESDM, such as the framework of joint activity routines, positive affect, modulation of arousal, and adult sensitivity and responsivity, are not explicitly formalized in other ABA-based approaches such as EIBI or PRT, as portrayed in manualized procedures and fidelity systems (McEachin, 2016). Hence, ABA is still commonly regarded as a behavioural intervention rather than as a Naturalistic Developmental Behavioural Intervention (NDBI) as the ESDM is regarded (Vivanti & Stahmer, 2020)

Furthermore, while the age of diagnosis has steadily been decreasing, the number of children reaching diagnostic thresholds has increased substantially (Christensen et al., 2018). In step with these changes, more recent evidence has pointed toward group-based intervention as a viable approach for young children, which is potentially more cost effective and sustainable, while at the same time allowing children to be better integrated with peers (Fulton et al, 2014; Vivanti et al., 2018). These factors, collectively, have suggested the potential benefits of a more inclusive approach to early intervention delivered through universal early childhood education and care (ECEC) settings as an important part of the strategy to meet the clinical and social needs of young children. Moreover, children with ASD often already attend ECEC services (Blackmore et al., 2016), an environment where their developmental and behavioural issues might first be identified and initial attempts to support children and families may already be in place. This chapter provides a critical overview of the key issues preventing effective integration of children with ASD into mainstream ECEC settings and

foreshadows the three main studies that comprised this PhD thesis, designed to respond to these limitations. This chapter was not prepared for publication.

Delivering intervention in mainstream ECEC settings, however, is not straightforward and requires careful consideration of the approach and the challenges to successful intervention outcomes. Traditional approaches to intervention for ASD have typically relied on intensive, one-on-one therapeutic practices that are not well-aligned with inclusion and integration of children into mainstream ECEC services - an environment where pedagogical practices typically emphasise play-based and group activities focused on children's interests, collaboration and communication, and inclusion of children with diverse abilities. More recent approaches to intervention for young children with ASD, however, adopt a more *naturalistic* approach that emphasises the contexts of children's everyday lives and has some synergies with ECEC settings. These more naturalistic approaches to early intervention, termed *Naturalistic Developmental Behavioural Interventions* (NDBIs; Bradshaw et al. 2015; Schreibman et al. 2015; Whitehouse et al. 2020), are characterised by behaviourally and developmentally sensitive teaching practices that are tailored to the child's contexts and interests. The NDBI approach utilises naturalistic and socially engaging routines that capitalise on child choice and the activities and routines that would happen in everyday situations. The arrangement of the environment is designed to facilitate child initiated interactions. In this way the child can experience the natural consequences of his or her self-initiated behaviour (Whitehouse et al. 2020).

Approaches to early intervention for children with ASD are presented and evaluated in Chapter 2, which also provides an account of the development and characteristics of NDBI interventions. Based on current evidence and its suitability for use in mainstream ECEC settings, the Early Start Denver Model (ESDM) approach is discussed in more detail in the final section of this chapter as an appropriate intervention framework for ECEC settings in which group-based learning contexts are commonplace and privileged because of their suitability for young children and the early learning environment. The ESDM is an early intervention focused predominantly on improving communication and pro-social skills within everyday play and care routines. As such, the ESDM is an excellent candidate for use in universal ECEC settings and provides the guiding approach for the research presented in this thesis.

While interventions that privilege naturalistic approaches, such as the ESDM, are promising for integration in universal ECEC services, they have brought into sharp focus the acute and common problem of comorbid challenging behaviours in children with ASD, and the impact of such behaviours on other children and staff (Grace et al., 2008). Furthermore, despite the apparent synergies between more naturalistic interventions and ECEC environments, there have been relatively few attempts to understand the perspectives of parents and educators, without whose active participation such interventions cannot succeed.

While the genesis of challenging and unwanted behaviours for children with ASD is thought to reside primarily in communication and social skills difficulties, the literature remains vague as to whether maladaptive behaviours are best managed via direct behavioural interventions targeted primarily at improving pro-social and communicative skills, or via a combination of these approaches. The first study presented in this thesis (see Chapter 3) examines whether the ESDM approach, an early intervention focused predominantly on improving communication and pro-social skills within natural daily play and care routines, addresses maladaptive behaviours in preschool-aged children with ASD. This is important, given previous research demonstrating the negative impact of maladaptive behaviours and developmental delays on the child's learning acquisition and the development of social relationships, particularly those relationships with typically developing peers (Pearson et al., 2006).

Therefore, the first challenge for this thesis was to establish whether a viable therapeutic approach for intervention delivered in mainstream ECEC settings was effective in quickly reducing the prevalence, duration and intensity of unwanted behaviours. To explore this possibility, the efficacy of an appropriate naturalistic intervention, the ESDM, in reducing unwanted behaviours was first examined in a specialist group-based setting with children under 5 years of age (see Chapter 3). This step was taken to ensure that the approaches and strategies for reducing unwanted behaviours were effective in a cohort of children with ASD before attempting to transpose this approach to a mainstream ECEC setting.

The second question to explore in this thesis was to establish whether the delivery of an ASD intervention through mainstream ECEC settings was desirable and supported by parents and

educators. Given that the needs of these stakeholders are quite different, distinctive approaches were adopted with each. For parents, it was important to first establish their priorities and preferences for their child's education and experience, and to determine how their priorities and preferences aligned with their experiences in mainstream services. Consequently, semi-structured interviews were conducted with parents to establish their needs, feelings, and priorities (see Chapter 4). For educators, the implementation of naturalistic early intervention for children with ASD requires the acquisition of new knowledge and practice change. Consequently, in this group it was important to first examine (through the baseline interviews) the challenges and needs for specialist training, and then evaluate (through questionnaires) whether the targeted training ameliorated the challenges and met their needs. Hence, qualitative interviews (pre-intervention) and questionnaires (post-intervention) were used to understand the experience of ECEC educators and test the viability of such an *in situ* approach (see Chapters 6 and 7).

Whilst it is evident that there is great potential for the delivery of more naturalistic and inclusive early intervention for children with ASD through ECEC, for this approach to be efficacious and deliver positive outcomes there are various obstacles and different stakeholder groups that create complexity. In the current thesis, pre-existing barriers to such a transformation in intervention delivery were explored, and the perspectives of key stakeholders examined, without whom such intervention will be impossible. In this critical overview, these contexts of the current research are described (see 1.2 and 1.3) and the major findings of the thesis are presented in section 1.4. A brief outline of the thesis is provided in section 1.5.

## **1.2 Barriers to mainstream ASD intervention presented by unwanted behaviours**

Children with ASD frequently engage in challenging unwanted behaviours such as aggression, self-injurious behaviour, and stereotyped behaviours (Dominick et al., 2007). These behaviours can be of equal or greater concern for parents and educators than the core features of ASD, and they can have a significant impact on behaviour management and learning, as well as impeding

the development of social relationships (Pearson et al., 2016). Such impacts on a young child create substantial barriers to their inclusion and community participation. Challenging behaviours are particularly problematic in ECEC settings as they disrupt the learning program and place children at increased risk of social exclusion (Allik et al., 2006). Research examining approaches to the inclusion of children with ASD have cited challenging behaviours as the greatest barrier (Grace et al., 2008). When combined with other barriers such as (i) lack of specialist pre-service professional development, (ii) insufficient knowledge and understanding of ASD and its impact on a child's development and behaviour, (iii) ECEC leadership that may not consistently promote or support inclusive practices, and (iv) higher child to staff ratios across the ECEC sector, the inclusion of children with ASD becomes profoundly challenging and the need for infrastructure that provides comprehensive support becomes clearer. The pervasive negative impact and consequences of unwanted behaviours in children with ASD are described in more detail in the following subsection, and their impacts on the inclusion of children with ASD are outlined.

### **1.2.1 Unwanted and challenging behaviours in children with ASD**

Children with ASD can demonstrate a range of challenging behaviours, such as stereotypies, aggression, property destruction, self-injury, and injury to others (Horner et al., 2002; Militerni et al., 2002; Symons et al., 2005). These behaviours have a detrimental impact on their quality of life and their families and are often cited as the primary reason for referral to intervention services before an ASD diagnosis is even established (Bushbacher & Fox, 2003; Hastings & Brown, 2002; Matson & Minshawi, 2006; Plant & Sanders, 2007). Because these behaviours are severe in intensity and duration, they pose a significant risk to the physical safety of children with ASD and those around them, which can cause anxiety among peers and educators (Sigafos et al., 2003). Thus, in addition to the negative impacts experienced directly by children with ASD, challenging behaviours often have significant negative impacts on peers, educators, and parents, who can experience anxiety, stress, fear and even harm (Hastings et al., 2005)

Without appropriate evidence-based management strategies for challenging behaviours, children cannot fully participate in interventions for the underlying ASD symptoms and other co-morbid

conditions (Lecavalier et al., 2006). In turn, this situation significantly reduces children's social and educational opportunities because of limited access to learning experiences, interactions with others, and opportunities for community engagement, as well as impacting their ability to transition to and participate in mainstream education. In sum, the negative impacts of such behaviours are amplified because they restrict access to ongoing learning opportunities and educational programs, and thereby create cascading negative impacts on children's overall development. Furthermore, if unwanted behaviours go untreated, they are more than likely to persist into adulthood and continue to increase in severity as the child matures physically (Murphy et al., 2005).

Given the critical nature of co-morbid behaviour problems for many children with ASD, it is imperative that intervention approaches address the issue of challenging behaviours early in children's development (Myers & Johnson, 2007). This need is particularly salient in group settings such as ECEC where many children with ASD are already enrolled prior to diagnosis and at risk of becoming excluded or experiencing the cascading negative impacts described above. Because unwanted behaviours cause such disruption to programs and fear in others, a solid mastery of behaviour management techniques is required by the educators working in these settings (Vivanti et al., 2017), but they are often ill-equipped to support children with complex behavioural presentations.

### **1.2.2 Educator preparedness to effectively include children with ASD**

Challenging behaviours in children with ASD represent a major barrier to their inclusion in ECEC settings and contribute to staff stress, burn-out and high turn-over within the ECEC sector (Grace et al., 2008). A 2015 Australian Education Union survey found 61% of respondents claimed that their pre-service training and subsequent professional development had not equipped them with the skills or confidence to teach children with ASD (NSW Department of Education, 2020). In 2016, it was reported that educators felt they lacked skills and specific strategies to understand and respond to the challenging behaviours of children with ASD in group settings (NSW Department of Education, 2020).

The process of reducing challenging behaviours in children with ASD in order to increase participation in universal educational programs is inexorably linked to the need to build workforce



capacity and reduce the stress levels in educators working with these children across multiple settings and service types. Meeting these needs could enable educators, with specialist skills and confidence, to include children with ASD at a high level of participation, which is the hallmark of inclusion (NSW Department of Education, 2020), and likely prevent or lessen the cascading negative impacts experienced by children with ASD. These issues are dealt with in Chapter 3, which presents an initial investigation of an ESDM approach delivered by (trained) ECEC educators within a specialist setting to address maladaptive behaviours in preschool-aged children with ASD, and Chapter 6, which investigates the feasibility and outcomes of establishing fidelity of the ESDM in mainstream ECEC educators by applying a professional learning program (PLP) – *One of the Kids* – to three mainstream ECEC settings.

### **1.2.3 Summary: The opportunities and importance of participation in mainstream ECEC settings for children with ASD**

In this section, the pervasive negative impacts of unwanted behaviours have been described and placed within a developmental context. It is clear that there are considerable challenges for children, parents, and educators in overcoming such impacts, but it is also clear that to do so creates many potentially positive opportunities for children with ASD. In particular, an inclusive approach to the delivery of autism interventions, if unwanted behaviours can be managed, is not only socially appropriate but has the potential to be instrumental in promoting important communicative and social skills in the child with ASD (Baglieri & Shapiro, 2017). An inclusive ECEC setting (see section 2.6) naturally provides opportunities for a child with ASD to cultivate the social behaviours needed to interact with peers, thereby supporting development in the social and communicative domains (Koegel et al., 2001). Furthermore, the play-based pedagogies that characterise high-quality ECEC settings lend themselves to some of the more naturalistic early intervention approaches for children with ASD. Embedding these approaches could help support children with ASD to participate more fully alongside their typically developing peers, through enabling environments and informed pedagogical practices that facilitate full participation for all children.

Findings suggest that children with ASD benefit from the opportunities ECEC programs provide for observational learning from their typically developing peers (Rogers & Dawson, 2010; Taylor & DeQuinzio, 2012). Of equal importance, Schertz and colleagues (2011) argue that ECEC participation can increase parent wellbeing and knowledge of their child's disability, and potentially also improve the quality of parent-child interactions. Furthermore, children with ASD have the right to be involved and confident learners, with a strong sense of identity and wellbeing (Konabe et al., 2014). To achieve inclusion, children with ASD need to be supported by differentiated teaching strategies designed to optimise their learning and participation to their fullest capability (NSW Department of Education, 2020). To realise these benefits, however, it is first critical to show that unwanted behaviours can be effectively responded to and reduced within such settings; the topic of the study presented in Chapter 3.

### **1.3 Understanding the needs and wishes of parents and educators**

The second question to explore in this thesis was to establish whether the delivery of an ASD intervention through mainstream ECEC settings was desirable and supported by parents and educators. High-quality ECEC in Australia is, in part, defined by the qualities of the partnerships established between educators and caregivers. Quality Area (QA) 6 of the National Quality Standard (NQS; Australian Children's Education and Care Quality Authority [ACECQA], 2020) sets out expectations that services engage in collaborative partnerships with families and, critically, specifies the importance of access and inclusion for all children (see QA6.2.2, which states that, *effective partnerships support children's access, inclusion and participation in the program*). These standards reflect a rights-based approach within the Australian Early Years Learning Framework (Department of Education, Employment and Workplace Relations [DEEWR], 2019), which provides, "a strong theoretical and philosophical foundation for respecting diversity and acting for equity and inclusion of all children" (Warren et al., 2016, p.19). Nevertheless, full inclusion of children with disability is still far from being realised (Wysockie, 2018) and there are important issues facing both parents and educators, some of which are shared by both groups and some of which are specific to their distinctive

roles, as well as issues that relate to the nature of the disability and the needs of individual children. Currently, expectations of parents for fully inclusive environments in ECEC are not matched by a suitable and proportional investment in preparing the ECEC sector to respond to such expectations and provide high-quality evidence-based programs for children and their families. It is within this context that the needs and wishes of both parents and educators require careful consideration.

While it is evident that there is great potential for the delivery of more naturalistic and inclusive early intervention for children with ASD through ECEC, and the emergence of NDBIs in the early intervention literature is consistent with parents' wishes to have their children more included in mainstream settings, for this approach to be efficacious and deliver positive outcomes it is critical that children are not perceived and treated as the main barrier to successful inclusion. To understand the complexities of successful inclusion, it is also necessary to consider the perspectives of caregivers and educators, and thereby recognise the challenges facing all groups involved in inclusive practice.

While the question of whether children with ASD should be educated in segregated or inclusive mainstream services is ongoing (Pellicano et al., 2018), the prevalence of ASD coupled with a paradigm shift from segregated to inclusive education warrants further research on the barriers and enablers encountered in the inclusion process. From a human rights perspective, there are clear recommendations concerning the education of a child with a disability occurring in the least restrictive environment that includes opportunities for interactions with typically developing peers (United Nations, 2006). As already noted, current policies and legislation in Australia are compliant with human rights movements expressed in international conventions and charters, including the Salamanca Statement (United Nations Educational, Scientific and Cultural Organization [UNESCO], 1994) and the Convention on the Rights of Persons with Disabilities (Chireshe, 2013; Mutepfa et al. 2007).

Regarding parents, there is a body of qualitative research that explores their perspectives on the benefits to their children of inclusion in mainstream ECEC services (Lazzari & Vandenbroeck, 2012; Rogers & Dawson, 2010; Taylor & DeQuinzio, 2012). This literature suggests that parents believe inclusive settings will benefit their children by providing opportunities to build their independence, self-esteem, functional daily living skills and participation in creative activities. They also believe that

these opportunities will improve community understanding and acceptance of children with disabilities (Sosu & Rydzewska, 2017). Parents also raise concerns regarding social exclusion (i.e., peer rejection) as a risk associated with mainstream ECEC attendance, leading to a negative impact on their child's sense of emotional wellbeing (Hewitt-Taylor, 2008). Despite such concerns, however, parental beliefs, current prevalence rates of ASD, regulatory requirements, and ethical considerations mean that the pathways for more inclusion of children with disability in mainstream ECEC settings are opening up and the views, experiences, and needs of parents form a critical component of successfully integrating their children.

From the point of view of high-quality ECEC practice, inclusion of children with disabilities is a practice that is promoted and legislated internationally across the ECEC sector (Caruana & McDonald, 2018). The belief that children with disabilities should participate alongside their typically developing peers within naturalistic ECEC settings is a shared value for many ECEC professionals (Warren et al., 2016). However, the inclusive setting can present many challenges for teachers and children with and without ASD, and their parents (Barnes, 2009; Eldar et al., 2010; Humphrey, 2008). There is recognition amongst educators that certain children require specialised services and educators themselves need support to respond appropriately to children's needs. However, while pre-service training mandates some teaching of skills within the domain of special needs, the pre-service preparation of educators is usually inadequate to establish effective skills without further supervision or capacity building (British Educational Research Association [BERA], 2018; McLean, 2016; Zosh et al., 2017).

Finally, it is also important to recognise that many children with ASD are already enrolled in mainstream services prior to diagnosis, meaning that educators are not necessarily in an ideal position to effectively guide and implement inclusive practices. Despite these complexities, there is considerable data emerging regarding the effectiveness of educator capacity building for achieving child-related outcomes (BERA, 2018; McLean, 2016., Zosh et al., 2017) but currently no criteria or guidelines exist to assess the capacity of mainstream ECEC settings to embed ASD early intervention within their programs, and there is limited understanding of educator perspectives and expectations in regard to this service delivery model.

In sum, because parents/caregivers and educators have different needs and experiences, distinctive approaches were adopted in the current thesis to examine the perspectives of each group. For parents, it was important to first establish their priorities and preferences for their child's education and experience, and to determine how their priorities and preferences aligned with their experiences in mainstream services. Consequently, semi-structured interviews were conducted with parents to establish their needs, feelings, and priorities (see Chapter 4). For educators, the implementation of naturalistic early intervention for children with ASD requires the acquisition of new knowledge and practice change. Consequently, in this group it was important to first examine (through the baseline interviews) the challenges and needs for specialist training, and then evaluate (through questionnaires) whether the targeted training ameliorated the challenges and met their needs. Hence, qualitative interviews (pre-intervention) and questionnaires (post-intervention) were used to understand the experience of ECEC educators and test the viability of the One of the Kids PLP as an *in situ* approach delivering a naturalistic, evidence-based early intervention for ASD (see Chapters 6 and 7).

## **1.4 Findings and contributions of the current thesis**

The findings of this thesis were conclusive in various respects. First, as shown in Chapter 3, it was clear that the ESDM intervention, which exemplifies the naturalistic approach, was efficacious in reducing unwanted behaviours when administered in a group setting. While this finding was very encouraging, it should be noted that the intervention was delivered by educators who had been trained specifically in the model and who were working in a specialised community-based group setting. Nevertheless, this study establishes that the most acute barrier to inclusion of children with ASD in mainstream services (i.e., challenging behaviours) and the delivery of intervention in a group setting could be overcome by this approach.

Second, as shown in Chapter 4, qualitative interviews with parents demonstrated that, without exception, the parents in the study wanted their child to be included in mainstream services alongside typically developing peers. Despite parents' wishes, their children were not participating fully in such programs and, in many cases, had their hours restricted or were being excluded because of

maladaptive and unwanted behaviours. As a result of such exclusion, parents were searching for a mainstream setting where staff had the necessary skills and training to engage and teach their child with ASD, and manage their maladaptive behaviour, so that they could participate directly in a mainstream ECEC. While the findings of this study were limited to a small qualitative sample, they were remarkable in their consistency, and they concur with the demand in the sector for places in mainstream ECEC for children with ASD.

Finally, as discussed in Chapter 6, this thesis shows that the PLP, One of the Kids, which was based on the ESDM, could be implemented with fidelity, defined as adherence to the ESDM Teaching Fidelity Rating System (Rogers & Dawson, 2010) – in mainstream ECEC services and was acceptable to the educators involved because of the perception that it cultivated their skills and understanding, while also integrating well with the EYLF. Together, the findings of this thesis go some way to establish the viability of an inclusive, naturalistic intervention for children with ASD delivered through universal ECEC settings, which must be an important part of the strategy to meet the clinical and social needs of young children. In the remaining section of this chapter (1.5), a brief overview of each remaining chapter is provided.

## **1.5 Outline of the thesis**

This thesis examines the appropriateness and impact of an evidence-based autism specific spectrum disorder (ASD) intervention – Early Start Denver Model (Rogers & Dawson, 2010) – when delivered by educators across a range of Early Childhood Education and Care (ECEC) settings.

**Chapter 1** provides a critical overview for the purposes of introducing the thesis topics and the rationale for the sequence of the published studies. This chapter also presents the challenges experienced by the high prevalence of ASD and the sparsity of bespoke services, for young children and families.

**Chapter 2** establishes: (a) the nature of ASD, including its aetiology and diagnosis; (b) the need for evidence-based early intervention approaches to address the range of developmental challenges faced by children experiencing ASD, their families and their educators; (c) the importance of early identification and intervention. In light of these considerations, the Early Start Denver Model (ESDM)

is identified in chapter 2 as a likely candidate for adaptation to mainstream ECEC services because of its heavy utilisation of normative developmental constructs (i.e., imitation, communication, joint attention and social development), rigorous manualisation and training processes, explicit curriculum, and promising evidence for its efficacy for a diverse range of children. The review of literature and examination of practice-based considerations presented in this chapter, establish that the ESDM approach is a viable and promising candidate for early intervention for ASD children, delivered by (trained) educators within mainstream ECEC settings. The rationale for the ESDM and the core elements of this approach are examined in light of their appropriateness for use within mainstream ECEC settings.

**Chapter 3** presents an initial investigation of an ESDM approach delivered by (trained) ECEC educators to address maladaptive behaviours in preschool-aged children with ASD. This 11-month intervention, delivered in an Autism specific ECEC with 38 children showed drastic improvements in the reduction of maladaptive behaviours in 79% of the sample. Whilst these initial findings were very encouraging, the intervention environment was a specialised service that differed from a mainstream ECEC service in important respects. Specifically, these differences included: a multidisciplinary team comprising teachers, educators, and allied health staff; specialist ESDM training for every member of the multidisciplinary team; and a 1:4 staff to child ratio, which was comparatively higher than mainstream ECECs ratio of 1:5 (2-3yrs) or 1:10 (3-5) for the same age group. Furthermore, every child had a diagnosis of ASD and thus no typically developing children participated in this setting. Nevertheless, the findings establish that the ESDM approach can be delivered with fidelity by mainstream educators who have undergone the rigorous training and certification processes in this model.

**Chapter 4** examines the perspectives of parents who have enrolled their child with ASD in mainstream ECEC services so as to embed and consider the parent voice as part of the intervention process. Fifteen families participated in qualitative interviews to ascertain whether intervention, provided in a mainstream ECEC setting, was identified as a priority. The findings of these interviews indicated that parents were primarily motivated to enrol their children in mainstream ECECs so they could benefit from social interactions with typically developing peers. Despite reporting on the many

challenges encountered in securing a place for their child at a centre that was willing and able to meet their child's needs, parents still felt that their child's development was best supported through participation in a mainstream ECEC service. These parental perspectives and expectations contribute to the importance of understanding the plausibility of embedding an appropriate ASD intervention – of which the ESDM is a good example – in mainstream ECECs and highlights the additional importance of establishing fidelity in the delivery of such an approach.

**Chapter 5** outlines the development and methodology of a PDP designed specifically for mainstream ECEC educators and based entirely on the ESDM Teaching Principles and Curriculum Checklist, with the aim of establishing fidelity across all educators on the team, not only the lead educators. It was important to identify the specific supports needed by educators to achieve fidelity of implementation with confidence and competence, and to develop a PLP that built workforce capacity across all educators, including those without university qualifications who make up the majority of a mainstream ECEC team. This chapter describes an attempt to bring an evidence-based approach to ASD intervention into mainstream ECECs and to enable greater access for children with ASD and their families to these services by enhancing the practices of regular educators. The PLP was called *'One of the Kids': Strategies for understanding, engaging and guiding the behaviour of young children with ASD in mainstream settings*.

**Chapter 6** investigated the feasibility and outcomes of establishing fidelity of the ESDM in mainstream ECEC educators by applying the professional development program – 'One of the Kids' to three mainstream ECEC settings. Results of this final study found that the benefits of engagement with mainstream ECECs supported educators to develop the knowledge, understanding and strategies to engage and teach children with ASD and guide their behaviours.

**Chapter 7** concludes the thesis with general discussion and summation of topics covered. Limitations of this thesis are outlined and pedagogical implications are explored and opportunities for future research are identified.



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## **Chapter 2: Literature Review**

### **2.1 Introduction**

While Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental disorder, there is evidence to suggest a range of outcomes for young children with this diagnosis can be improved through effective early intervention. In this chapter, the nature of the evidence base and the emerging trends in ASD early intervention are examined. The key elements of efficacious intervention (2.4.3) are identified and then related to the dominant evidence-based approaches currently used in the early years (section 2.5). This discussion is concluded by summarising the features of effective interventions (2.5.9) and an in-depth consideration of the importance of an inclusive frameworks and practices going forward (section 2.6). The Early Start Denver Model (ESDM) is identified as an example of an effective intervention that is gaining attention worldwide. While the background information supporting the ESDM as an appropriate approach for inclusive, mainstream early intervention is explained in detail in this chapter, section 2.8 describes the ESDM in more detail. This chapter was not prepared for publication.

### **2.2 Background**

#### **2.2.1 Autism Spectrum Disorder**

The term Autism Spectrum Disorder (ASD) refers to a neurological disorder that significantly impacts an individual's development, learning, adaptive behaviour, and functioning, with particular difficulties in socialization and communication functioning (American Psychiatric Association [APA], 2013). ASD is also associated with a restricted range of interests and repetitive patterns of behaviour (APA, 2013). While the current terminology (i.e., ASD) is of fairly recent origin, descriptions of individuals that may have had ASD date back to the early 1800s (Gillberg, 2007). However, the first systematic description of the condition that is now known as ASD was published by Kanner in 1943. In this description, Kanner appears to have been the first to use the term autism as a diagnostic concept (Vivanti & Salamone, 2015). He described a group of 11 children who displayed

social and communication deficits as well as rigid, obsessive behaviours, as unable to “relate themselves in the ordinary way to people and situations” (Kanner, 1943, p.242).

The core symptoms of ASD still include those originally described by Kanner (1943), such as: (i) social communication difficulties including limitation in eye contact, imitation and expressive and receptive language skills, and (ii) a restricted range of interests, rigid or ritualistic behaviour, and repetitive or stereotyped behaviour. These symptoms are included in the current gold standard diagnostic definition of ASD, found in the 5th Edition of the Diagnostic and Statistical manual of Mental Disorders (DSM-5; APA, 2013). In the DSM-5, ASD is conceptualized as a spectrum disorder rather than a set of discrete mutually exclusive diagnostic categories. This means that Autistic Disorder, Asperger’s Syndrome, and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) are now all included under the umbrella term ASD. The use of the term spectrum to describe autism acknowledges the shared central features of the subgroups that make up the spectrum without ignoring the high levels of variability in severity and presentation of symptoms amongst individuals with a diagnosis of ASD (Lai et al., 2013). It is still the case that in much of the literature the terms autism and autism spectrum disorder (ASD) are considered synonymous and are used interchangeably (Vivanti, & Salamone, 2015).

### **2.2.2 Prevalence**

Current estimates suggest the prevalence of ASD at 1 in every 54 children (Centre for Disease Control and Prevention [CDC], 2020), represents a dramatic increase in the number of children receiving an ASD diagnosis over the past few decades (Schwartz et al., 2004). The reasons for the apparent increase in the prevalence of ASD are still a topic for debate. It has been argued that the increase is a natural outcome of the awareness, understanding and increased diagnosis of ASD, combined with the broadening of characteristics required for diagnosis (Matson & Kozlowski, 2011). Others suggest that the increase could be partly explained by improved survival rates of premature infants (Matson & Kozlowski, 2011) with evidence suggesting there is a heightened risk of neurodevelopmental disorders in extremely premature infants (Kuzniewicz et al., 2014). It has also been suggested that certain environmental neurotoxins may have contributed to the increase (Palmer



et al., 2006; Windham et al., 2006), however at present there is no clear evidence to support this claim (Matson & Kozlowski, 2011).

It is important to note that prevalence studies, “have generally failed to control for changes in case-definition and case-finding methods” (Fombonne, 2002, p.6) and it is therefore difficult to make comparisons across studies and interpret differences found in rates over time (Matson & Kozlowski, 2011). Whilst further research is clearly required to understand the reasons for shifting prevalence rates, it is self-evident that ASD is indeed prevalent and presents ongoing challenges for our communities to ensure that children can reliably access the support they need to improve developmental, learning, and wellbeing outcomes.

### **2.2.3 Aetiology**

The wide range of theories that exist regarding the aetiology of ASD have also shifted in line with research findings. Originally, autism was believed to be a type of childhood psychosis (Gillberg, 2007). More recently, a number of different causes of ASD have been suggested such as vaccination, in particular thimerosal-containing vaccine and the measles, mumps, and rubella (MMR) vaccine, has also been suggested as a possible cause of autism (Miller & Reynolds, 2009). This suggestion was originally made by Wakefield et al (1998) who described an apparent link between the administering of the MMR vaccine and the onset of autism in a group of six young children. Their paper was subsequently retracted, and further studies have failed to identify any link between vaccination and autism (Miller & Reynolds, 2009).

While the exact cause of ASD remains unknown (Johnson & Myers, 2007), there is evidence to suggest it has a neurodevelopmental and genetic basis (Parellada et al., 2014). ASD is highly heritable; many genes have been shown to carry the risk for autism and numerous twin and sibling studies have demonstrated that genetic factors contribute to the aetiology of ASD (Parellada et al., 2014). Differences between the brain structure and function of individuals with ASD and typically functioning individuals has been established (Ecker et al., 2013;). It is believed that the brain structural connectivity is compromised in individuals with ASD, with connections between the frontal and temporal cortices particularly affected (Geschwind & Levitt, 2007). Additional biological factors

that may explain the aetiology of ASD include the immune, inflammatory, oxidative, and mitochondrial systems (Parellada et al., 2014), as well as low levels of social neuropeptides such as oxytocins (Jacob et al., 2007).

Consideration of the interaction between genetic and environmental variables could be critical to the understanding of ASD (Dawson, 2008). Lovaas (2003), for example, outlined possible mechanisms by which genetic and environmental variables could interact to result in developmental delays. This account elaborates some ideas proposed earlier by Ferster (1964) regarding the development of “autistic” behaviour. One of the ways in which the environment is believed to impact upon the development of ASD is via the atypical interaction with the environment that children with ASD typically exhibit due to deficits in social, communication and emotional domains. These deficits, which are commonly evident by 12 months of age, lead to reduced engagement with the social world, resulting in altered early experiences for children with ASD that may act, in turn, as a risk process in the developmental course of the disorder (Dawson, 2008). From this perspective, while ASD may set in motion a way of interacting that is not socially adaptive, over time the impact of such patterns is amplified because of the innumerable interactions and experiences that children with ASD miss out on. This possibility alone means that early identification and intervention is likely to be of very profound significance for children with ASD, an issue described and taken up in detail below (see section 2.3.1).

## **2.3 The importance of early identification and intervention for ASD**

As noted above, contemporary understanding of ASD shows that it has a high prevalence and strongly suggests that early intervention is likely to bring about greater benefits for children and families because of the interaction between core ASD features and children’s participation in social and learning environments. In this section, contemporary thinking and research on the importance of bringing young children with ASD back into more-typical developmental processes is briefly discussed. This discussion precedes a consideration of current diagnostic practices and norms, which serves as a gateway for accessing services and interventions. In the final section, a rationale for pursuing early identification and intervention is presented, which also takes into consideration the

emergence of unwanted behaviours in some children with ASD that present a significant obstacle to early intervention and inclusion if they are not attended to early in development or if they are allowed to become entrenched.

### **2.3.1 ASD and early development**

While it is important to note that intervention at all ages can be shown to be effective for children with ASD (Whitehouse et al., 2020), it is generally agreed that early childhood intervention should begin at the point of diagnosis and younger age of diagnosis is associated with greater improvements and better developmental outcomes (Weitlauf et al., 2014). Despite broad consensus for the benefits of early identification and intervention, there is still much to be learned about early development for children with ASD. While research is continuing to provide a greater depth of understanding about early development and how it is impacted by ASD, a lack of universal agreement about what early interventions are most efficacious makes it difficult for families and professionals to navigate this landscape (Roberts et al., 2016). It is therefore an important goal to better understand the impact of ASD on a young child's development.

The prevalence of repetitive object-oriented play and deficits in social communication means children with ASD experience significantly fewer learning opportunities than their typically developing peers in the prior to school years (Lang et al., 2016). This means that they miss multiple opportunities to learn new and more conventional play skills from their peers, which in turn appears to have a cascading negative effect on their overall development. Hence, interventions that target foundational skills such as social motivation, attention, imitation, and functional toy play, may provide children with ASD greater access to these valuable learning opportunities with peers (Lang et al., 2016). It follows that the earlier children learn these foundational skills, the less likely they are to accumulate learning gaps over time and fall further behind their peers. Furthermore, the experience of educating children with ASD alongside their typically developing peers may enable increased opportunities for learning and increase independence when the process of inclusion is successful.

The focus on early intervention for children with ASD is consistent with previous research that has shown they have difficulty sharing their emotions with others (Dawson et al., 1990),

indicating that the regions of the brain related to social reward are less active in children with ASD, an impact that is evident very early in development (Dawson, 2008). Hence, interventions that use strategies to explicitly promote the sharing of positive affect and draw children's attention to faces, voices, and actions to increase their motivation to engage socially with a play partner, may alter the brain and increase the reward value of social stimuli (Fava & Strauss, 2014; Rogers et al., 2014). Delivering intervention that increases the child's motivation to attend to social stimuli may also enable the learning of more advanced social skills (Dawson, 2008). One study, for example, showed that children aged 2 – 3 years of age with ASD who received two years of intensive intervention that prioritised positive social interactions and social games containing a fun element, had similar activation in brain areas associated with attention to faces as their typically developing counterparts (Dawson et al., 2012). The results of this study suggest that the intervention was effective in improving some of the brain processes associated with social interaction but may also indicate limited generalisability to other areas of brain functioning. To this end, there is a need to continue to investigate intervention approaches that focus on redirecting the child's attention from objects back to people, their faces, voices and actions, and to establish whether such interventions increase activation of the brain areas associated with perceptual processing of faces and social orienting, potentially increasing generalisability to other critical areas of brain functioning. Such approaches would target the acquisition of specific skills such as joint attention, imitation, and functional play, skills that emerge early in children's development and are certainly well established, normatively, before 3 years of age. These critical precursors to communication development are needed to enable children with ASD to participate more fully in the range of experiences that contribute to their learning and development (Vivanti & Stahmer, 2021).

In sum, there is emerging evidence, including that from carefully controlled studies, showing that most young children with ASD can be more effectively brought into social and communicative exchanges, which include affective engagement, during the early years (see Vivanti & Stahmer, 2021, for a discussion). This evidence increasingly suggests a foundation for earlier intervention that can bring about increased flexibility and participation in social and learning activities for young children with ASD, as well as promoting their independence (Estes et al., 2015). Despite these advances and

the potentialities they create, age of ASD diagnosis still lags behind our understanding of the development of the young child with ASD. In the next sections, therefore, the current diagnostic norms are discussed and contrasted with approaches that allow earlier identification of ASD symptomatology in children prior to their second birthday. Awareness of the early features and manifestations of ASD within early childhood environments, even before formal diagnosis can be made, is a critical factor in identifying and responding to children with ASD in a timely and appropriate manner.

### **2.3.2 Early diagnosis**

While 85% of parents are currently reporting developmental concerns well before 36 months, the median age of diagnosis remains relatively unchanged (Centers for Disease Control and Prevention [CDC], 2020). Screening tools are available and recommended for use between 18 and 24 months of age. However children are rarely identified with atypical development until their speech does not progress at later ages (Klass & Navsaria, 2021). This most often means that young children with ASD, under 4 years of age, are currently unlikely recipients of intervention in the critical early years. Given the early appearance of ASD symptoms and the impacts of ASD on early development (see section 2.3.1, above), it is important to understand how current diagnostic practices function and the rapidly changing literature that is putting downward pressure on the ages at which ASD can be diagnosed.

Diagnosis of ASD usually involves observation of the child using a standardized checklist (Chawarska et al., 2007). This method of diagnosis can be traced back to Polan and Spencer's (1959) Checklist of Symptoms of Early Infantile Autism, which is viewed as a pioneer of standardized autism assessment. Currently, the Autism Diagnostic Observation Schedule (ADOS-2) is used for accurate assessments of ASD and developmental disorders (Lord et al., 2012). It is a standardised diagnostic assessment of social, imagination and communication skills of individuals who may have characteristics consistent with a diagnosis of ASD. It is also a play-based assessment that triggers target responses, initiations and interpersonal interactions via planned social situations. These

communication opportunities are designed to elicit a wide range of verbal, physical, social and imaginative interchanges (Wiggins et al., 2019).

The gold standard assessment process for ASD diagnosis involves combining the ADOS with the Autism Diagnostic Interview-Revised (ADI-R), a structured interview used for diagnosing autism, planning treatment and distinguishing ASD from other developmental disorders (Wiggins et al., 2019). The ADI-R provides a thorough assessment of individuals suspected of having ASD and has proven to be a most useful tool for formal diagnosis as well as in the treatment and educational planning for individuals when used in conjunction with the ADOS (Wiggins et al., 2019). The DSM-5 also specifies the severity of ASD symptoms based on social communication impairments and restricted and repetitive patterns of behaviour, and in terms of support needs for each of the domains (APA, 2013).

While diagnosis typically occurs when a child is aged between three and four years of age (Chawarska et al., 2007), mounting research demonstrates that that early signs of autism are often visible between 12 and 24 months of age (Zwaigenbaum et al., 2015). Furthermore, it is now well known that toddlers with an older sibling with ASD are at heightened risk of receiving an ASD diagnosis, bringing the need for earlier diagnosis into even sharper focus (Monteiro et al., 2019). In addition to the availability of screening tools for the 18 to 24 months of age children, the American Academy of Pediatrics recommends the critical importance of screening for ASD occurring within this age-span, suggesting clinical recognition of the need to identify ASD early in development and respond accordingly.

In keeping with the focus on early identification of ASD, advances in genetic, neuroimaging, combined with other neurobiological research have also raised the potential of biomarker screening (Kasari et al., 2015). In addition, numerous studies (e.g., Chawarska et al., 2013; Vivanti et al., 2014; Frazier et al. (2016) have established atypical gaze and attention patterns as a defining characteristic of ASD, which may provide a mechanism for early objective identification of core ASD features. In the future, such eye tracking methods have the potential to objectively identify risk of ASD in infancy, although it should be noted that there is still considerable work to be done to translate these experimental findings into diagnostic and clinical practices (e.g., Mastergeorge et al., 2020)

In sum, recent research suggests that atypical behaviours may be detectable in some children at very young ages (6 – 18 months) (Monteiro et al., 2019) but the gap between reliable identification of ASD symptoms and formal diagnosis means that most young children will not receive intervention for 2 to 3 years after it is clear that their development is atypical and likely indicates features of ASD (for a discussion see Kuriakose & Shalev, 2016). When all recent evidence points to early intervention improving developmental and behavioural outcomes in infants and toddlers, there is an urgency in early identification and diagnosis at the youngest possible age.

### **2.3.3 Rationale for intervention at the earliest stage of development**

While genes set the stage for learning and development, advances in neuroscience have helped in understanding the impact of early experience in shaping the circuitry of a child's brain (National Scientific Council on the Developing Child [NSCDC], 2007). This has enabled a deeper understanding of the extent of neural plasticity in the first few years of a child's life, when the child's brain is forming synapses at a faster rate than at any other period. The early childhood period has been described as a *critical period* for brain development because of rapid brain growth, cortical specialisation, and development of the language and social learning regions of the brain (Holland et al., 2014). As environmental experiences have a significant impact on how the brain develops during this critical period, effective intervention may help to alter the brain while it is most malleable. Dawson (2008) has emphasised that the brain's malleable state during this period allows for optimal learning, a finding widely supported by developmental research that fuels increased focus on the first 2000 days of a child's life (e.g., NSW Health, 2019). Intervention in these early years capitalizes on a brain that is in a state 'ripe' for learning, with research demonstrating improvements across a range of clinical outcomes from intervention for children with ASD (Estes et al., 2015). Together, these perspectives have, in keeping with clinical experience, led to the increasingly widespread view that the younger a child is when intervention begins, the better the outcomes will be for that child (Debodinance et al., 2017).

While ASD interventions have been shown to be effective throughout development (Whitehouse et al., 2020), it has been argued that effective intervention should improve a child's learning rate,

typically used as a measure of a child's improvement in developmental outcomes over time (Kintwell, 2015). The opportunity for early intervention is facilitated by an understanding of the impact of a child's environment on the development of ASD, combined with early detection and diagnosis. If the goal of diagnosis is treatment (Vismara et al, 2009) then it would be reasonable to infer that the earlier the diagnosis, the better the outcomes for the child with ASD if intervention can be received at this earliest point. Studies supporting earlier intervention have documented the effectiveness of intensive early interventions for very young children with ASD (Drahota et al., 2012). A recent meta-analysis of single-subject experimental studies on interventions for young children with ASD, demonstrated positive effects in terms of reduced ASD symptoms and higher developmental scores (Debodinance et al., 2017). Most early intervention approaches target children with, or at risk, for ASD who are under the age of 5 or 6 (Perry et al., 2011). However, many of these studies focus on interventions implemented by researchers or therapists in one-on-one or specialist group settings, rather than inclusive group settings (Young et al., 2016) where many children with ASD are enrolled.

A further rationale for ASD intervention at the earliest possible age is the potential positive impact on family wellbeing and inclusion. When parents know that their child has a specific diagnosis, receiving therapy may help the family's coping mechanisms (Kuriakose & Shalev, 2016). Since having one child in a family with ASD increases the risk that siblings will have a related disorder, (Kuriakose & Shalev, 2016), early diagnosis and treatment could help parents prepare for subsequent children in ways that improve behavioural and social outcomes for their children. In turn, early childhood services, may be able to plan more effectively to meet the needs of these children (Kuriakose & Shalev, 2016).

Finally, it is important to emphasise that, quite apart from the potential benefits in reducing ASD symptom severity and improving outcomes, early identification and intervention has the added benefit of addressing unwanted or maladaptive behaviours (see section 1.2.1 for a brief discussion) before they escalate or become entrenched and prevent children's wider participation in social and learning interactions.



### **2.3.4 Summary**

In section 2.3 the importance and potentialities of earlier identification and intervention have been presented. The current weight of evidence points to improved overall outcomes in terms of social engagement and more independent functioning when intervention is undertaken early (Whitehouse et al., 2020). Currently, there is a range of evidence-based interventions that can be used for young children with ASD (Whitehouse et al., 2020). Some involve comprehensive treatment programs that target the core deficits of autism and others are narrower in focus, designed to target specific skills or developmental domains (Odom et al., 2010). Interventions also range from highly structured behavioural approaches to more socially and developmentally focused approaches (Debodinance et al., 2017). Further, there are a range of theoretical models upon which interventions may be based, with interventions based upon a behavioural model having the strongest empirical validation (Vismara & Rogers, 2010). In section 2.4, the importance of establishing evidence-based approaches to early intervention are first discussed, and then in section 2.5 a range of different approaches to early intervention is described with a view to establishing the most appropriate approach for inclusive practice (section 2.6) in mainstream early childhood settings.

## **2.4 Evidence-based practices and elements of effective ASD Intervention**

The prevalence of ASD, together with far reaching consequences of ASD for children and families, means that there has been a proliferation of approaches to providing intervention and early intervention (Whitehouse et al., 2020). Within this landscape, it is imperative, both ethically and in terms of clinical outcomes, to establish evidence-based practices (EBPs) that deliver improved outcomes for children and families. However, it is also important to recognise that EBPs are evolving and need to be responsive to a changing landscape that includes a diverse range of factors, including clinical trials, evolving evidence from other research approaches, differing community expectations, changes in funding models and so on. In this section, a discussion of EBP in relation to effective early intervention for ASD is provided with a view to establishing a framework for ongoing practice change and support.

Evidence-based practice can be defined as a process of amalgamating the most robust evidence available and combining it with clinical expertise and stakeholder perspectives, with the aim of promoting educational, health, or therapeutic outcomes in an individual (Frederickson, 2002). The framework of EBPs is not prescriptive but does rely on a careful appraisal of the evidence underlying the intervention as it applies to a particular individual and setting in which it is being applied (Whitehouse et al., 2020). EBPs also refer to specific interventions that have demonstrated consistent efficacy across high-quality empirical studies. Hence, EBP involves a process and an orientation to establishing and enacting empirically validated interventions (Reichow et al., 2008). To meet this need, the *Evaluative Method for Determining EBP in Autism* was developed by Reichow et al., in 2007. The evaluative method contains three instruments: (1) rubrics for the evaluation of research report rigor, (2) guidelines for the evaluation of research report strength, and (3) criteria for the determination of EBP. These instruments provide a standardised method for researchers, clinicians, and practitioners to evaluate the empirical evidence on autism interventions. Using the evaluative method also provides individual ratings for each study reviewed (Reichow et al., 2007)

It is strongly recommended that parents and professionals consider the evidence for the effectiveness of a particular intervention before choosing to implement it with a particular child (National Autism Centre, 2015). In doing so, it is important to consider whether an intervention has resulted in objective improvements for the majority of children who have received it, with the findings replicated across sites and samples (Travers et al., 2016). It is also important to note that while interventions with a strong evidence base may not always be suitable or effective for every child in every situation, they are less likely to be dangerous or cause harm (Travers et al., 2016). The use of EBPs is also acutely important in the field of ASD because of the high uptake of interventions lacking evidence for effectiveness, some of which may in fact cause harm (Roberts et al., 2016). Such interventions are described as *controversial interventions* and, while often popular with parents, they can result in limited measurable gains in the child's functioning and further restrictions in their behaviours, interests and diet. Some examples of these include *facilitated communication*, the *rapid prompting* method, *sensory integration therapy*, the *gluten-casein free diet*, and *chelation therapy* (Travers et al., 2016)

At present, the most prominent intervention models in use and under empirical investigation for young children with ASD adopt a naturalistic approach that is combined with behavioural and developmentally sensitive teaching practices called Naturalistic, Developmental, Behavioural Interventions (Bradshaw et al. 2015; Schreibman et al. 2015). These interventions rely on a transactional model of development (Sameroff & Chandler, 1975) wherein the quality and responsiveness of environmental factors influence child developmental gains and are highly mediated by how parents and other adults provide for, interact with, and talk to their children (Vivanti et al., 2018). One important underpinning of these interventions is Behavioural Intervention.

Theoretical underpinnings of ASD intervention continue to progress as our understanding of ASD develops. At this point in time, however, intervention approaches for children with ASD can be categorized into either *comprehensive* or *focused* interventions (Wong et al., 2015), depending on the extent to which they isolate specific behavioural goals (focused) or are oriented to achieve broad learning and development outcomes (comprehensive). The following sections outline each of these categories and provides a brief overview of the key elements that support effective ASD intervention.

#### **2.4.1 Comprehensive interventions**

Comprehensive interventions, “[...] consist of a set of practices organized around a conceptual framework and designed to achieve a broad learning or developmental impact on the core deficits of ASD” (Wong et al., 2015, p. 1951). These core deficits include language, cognition, play, and social skills (Odom et al., 2010). Children with ASD usually have needs across multiple domains of learning. Hence skills that are taught across a range of developmental domains can focus on integrating and generalising new learning across contexts and people in everyday interactions, activities and routines. A comprehensive approach can help to lay stronger foundations for later development (Whitehouse et al., 2020).

Comprehensive interventions typically provide a series of resources and practices organised around a conceptual framework that are designed to work together to provide a coherent approach to intervention across a range of contexts. This can include: (i) manualised interventions that prescribe the treatment model and the practices used to deliver that model with sufficient detail for replication

across professionals and settings; (ii) approaches that follow a well-defined conceptual framework; (iii) intensity in delivery of 20 to 25 hours per week; and (iv) duration of delivery that is a minimum of 12 months (Odom et al., 2010).

Comprehensive interventions, when delivered by a therapist at a high level of intensity and fidelity, are currently considered the most efficacious interventions for young children with ASD (Rogers et al., 2018). Participation in these interventions has resulted in significant gains in child IQ, cognition, communication, adaptive behaviour and social functioning, combined with decreased ASD symptoms (Magiati et al. 2014). Given that early gains are the best predictors of long-term outcomes (Magiati et al. 2014), any intervention that achieves this for young children could potentially be defined as an efficacious comprehensive early intervention approach (Rogers et al., 2018).

#### **2.4.2 Focused interventions**

Focused interventions, by contrast, target specific behavioural goals and are less intensive and shorter in duration (Odom et al., 2010). They are designed to improve specific behaviours, rather than overall functioning (Bradshaw et al. 2017). Focused intervention approaches target one domain of deficits in ASD, such as communication or social skills (Odom et al., 2010). This approach is limited in terms of its ability to meet the diverse range of needs, spanning multiple developmental domains, that are shared by children with ASD, thereby preventing the integration and generalisation of their overall skill development. Focused interventions can also potentially leave gaps in the child's skill development that are foundational to further learning and acquisition. Examples of focused interventions include the *Picture Exchange Communication System* (PECS; Frost & Bondy, 2002), *Social Stories* (Gray & Garand, 1993), and *Functional Communication Training* (FCT; Carr & Durand, 1985).

It is important to note, however, that because ASD is a highly variable condition that changes over time as a result of growth and development, even interventions with the most robust evidence may not be effective for all children all of the time (Roberts et al., 2016). So, while it is important to consider comprehensive interventions first, it is also sometimes necessary to look at modifications to these in response to lack of child progress. This is when focused interventions or other adjustments to

delivery can be utilised as an adjunct to comprehensive approaches. When child progress has indicated a need for modifications to the intervention being delivered, it is important to follow a systematic approach (Rogers et al., 2010).

### **2.4.3 Key Elements of Effective ASD Intervention**

Despite a growing evidence base, there continues to be a lack of clarity around which interventions work best for which children with ASD (Roberts et al., 2016). Further, there is great variability in various factors that are central to dominant approaches to intervention, such as the content and methodology of intervention models; the skills, attributes and practices of those delivering the intervention; child and family intervention goals; and the value that families place on certain intervention outcomes (Roberts et al., 2016). In response to this variability in design, approach and ideology, Roberts and colleagues (2016) put forth a set of underpinning principles or key criteria for choosing interventions for children with ASD. According to their principles (Rogers et al., 2018; Roberts et al., 2016), interventions should have the following elements:

1. Be grounded in research (evidence-based)
2. Aimed at improving social communication, enhancing learning and participation, and addressing challenging behaviours
3. Commence as soon as the child is diagnosed
4. Be delivered by a multi-disciplinary team of well-qualified and well-trained professionals
5. Incorporate parent support and training that is based on family-centred practice
6. Take account of family priorities, capacity, and child strengths and difficulties, age, and developmental level
7. Be comprehensive and individualised to the need of the target child
8. Address the core deficits of joint attention and social engagement while systematically improving cognition, communication, adaptive behaviour, and social functioning
9. Decrease/minimise the symptoms of ASD

In addition to these key elements of an ASD intervention is the question of intensity and specificity. To date, there is only modest advice regarding the factors that could inform the specificity

and intensity of intervention for young children with ASD (Roberts et al., 2016). This information informs all clinical and policy decisions regarding which interventions may be most appropriate for which children with ASD (Roberts et al., 2016). Therefore, more research is needed to address intensity combined with fidelity of delivery, and capacity for evaluation.

#### **2.4.4 Summary**

Reported variability in effects of interventions on outcomes for young children with ASD and the quality of the extant evidence highlights the need for decision making to be executed within an evidence-based practice framework (Whitehouse et al., 2020). Evidence-based practice is the “conscientious, explicit, judicious and reasonable use of current best evidence in clinical decision making” (Sackett et al., 2000, p. 19). Understanding and measuring outcomes of an intervention will facilitate the manner in which intervention practices can be differentiated to meet the strengths and support needs of children with ASD, their families and practitioners (Whitehouse et al., 2020). While there is a rich and increasing evidence-base to draw upon when selecting intervention approaches, it still remains critical to use formal and objective means to evaluate whether a given approach is efficacious for a specific child. In the next section, an overview is provided of current approaches to early intervention with a brief description of the evidence that supports such approaches and their strengths and weaknesses in terms of the criteria described in this section.

### **2.5 Choosing an intervention for children with ASD**

While it is known that children with ASD have early appearing difficulties with social communication and restrictive and repetitive behaviours (Roberts et al., 2016), it is also common for them to have emotional and behavioural problems (e.g., anxiety and attention deficit hyperactivity), intellectual impairment, and developmental delay (Prior & Roberts, 2012). For these reasons it is important to consider the effectiveness of different intervention approaches and to understand that certain interventions may be more appropriate for certain child profiles. No two children with ASD are the same, so whatever intervention is chosen, it will need to be responsive to child characteristics,

environments, and family priorities (Roberts et al., 2016). The role of parental priorities and perceptions is examined later in detail in Chapter 4.

Given the impact of an intervention on the life of a child with ASD and their family, it is also critical that choice of intervention is based on the highest quality evidence available (Whitehouse et al., 2020). The process of choosing an intervention should also be guided by the needs of the child and the core deficits of ASD, such as social engagement, communication, and joint attention (Schreibman et al., 2015). At the same time, the chosen intervention model should be an evidence-based practice that systematically improves specific communication, cognition, and other domain specific skills, while enhancing function and adaptive behaviour (Schreibman et al., 2015). There is a range of interventions that incorporate these key characteristics and has demonstrated quality of evidence for their effectiveness.

In this chapter, the main approaches to early intervention are presented and discussed with a view to identifying which approaches are most suitable for delivery in inclusive settings such as early childhood education and care. It is appropriate to begin with behavioural interventions as they formed the basis of many of the interventions that followed. Behavioural principles are also foundational to Positive Behaviour Support, which aims to broaden an individual's skills and experiences, through an enhanced environment, thereby improving their quality of life (Carr et al., 2002). It is important to note that behavioural principles have also informed the evolution of NDBIs described later in this chapter.

### **2.5.1 Behavioural Early Intervention**

Behavioural interventions have developed primarily from Applied Behaviour Analysis (ABA), which is the scientific application of behavioural principles to identify the variables responsible for changing behaviour and then to improve behaviours that are socially significant (Cooper et al., 2020). Skinner (1938) was among the first theorist to study what later became known as operant conditioning. His research led to the development of the principles of reinforcement, punishment, extinction, and stimulus control, all known as *operant conditioning*. Following systematic laboratory testing with rats, Skinner arrived at an effect known as *positive reinforcement*, which refers to an

increase in the probability that behaviour will recur when it is immediately followed by a specific consequence. When such a relation is observed the consequence can be defined as a reinforcer for that particular behaviour (Skinner, 1953).

Additional research led to other operant conditioning principles such as *punishment* (Alberto & Troutman, 2009; Catania, 2017), which refers to a sequence in which a response becomes less likely to occur when it is followed by certain (punitive) consequences. *Extinction*, in contrast, refers to a sequence in which the probability of a previously reinforced response gradually decreases when that response is no longer followed by a (reinforcing) consequence. *Antecedent control* is another principle of operant conditioning which refers to a discriminative stimulus. This infers that a response is more likely to occur when a specific stimulus is present compared to when that stimulus is absent. The stimulus sets the event for behaviour to be elicited and reinforced.

These operant conditioning techniques were initially used with typically developing children in managing behaviours (Long et al., 1958), then in the early 1960s researchers began exploring their effectiveness for supporting behavioural acquisition with children with ASD (Ferster & DeMyer, 1961). Results of the operant conditioning studies suggested that children with ASD were able to learn functional skills when they were taught in highly structured environments using extrinsic reinforcers such as praise, stickers, tokens and treats, rather than logical and contingent reinforcers that are contextualised to the child and activity and classified as intrinsic. Lovaas (1987) believed that outcomes for children with ASD could be enhanced by using the principles of operant conditioning to intervene in a wide range of behaviours (i.e., imitation, attention, and compliance), and that this should be done as early as possible.

However, the use of highly structured environments and extrinsic reinforcers does not lend these approaches to multiple learning environments where children spend most of their time, nor to the more naturalistic contexts where they could be learning through play and daily routines that are naturally contextualised to the child. To this end, it is important that any intervention approach for children with ASD is also consistent with a conceptual framework of developmental psychology that is rigorously operationalised (Vivanti & Stahmer, 2021). Although there is evidence for behavioural interventions such as ABA, there is an evolving landscape towards more naturalistic interventions that



are developmentally sensitive approaches with core developmental constructs, such as the use of joint activity routines, affective engagement, and sensitivity and responsivity that are reflected in manualised procedures and fidelity of implementation systems (McEachin, 2016; cited in Vivanti & Stahmer, 2021).

### **2.5.2 Discrete Trial Training (DTT)**

Discrete Trial Training, also derived from the theoretical framework of Behavioural Interventions, is another highly structured approach, thereby potentially restricting its applicability to multiple learning environments. It draws on the principles of ABA (Lovaas, 1987), involving breaking down skills into small, *discrete* components, to enable the teaching of skills one at a time in *discrete trials*. These learning opportunities have four components: (i) a clear antecedent/discriminatory stimulus, (ii) a single discrete response from the child, (iii) a reinforcing consequence for delivery of correct responses and error correction for incorrect responses, and (iv) a brief interval before repeating the antecedent to signal the start of the next trial (Lerman et al., 2016). The first three components are also referred to as the ABC – antecedent, behaviour, consequence format – a practice common to other comprehensive interventions. A DTT teaching session includes a number of learning trials which are presented in rapid succession, commonly referred to as mass trialling (Rogers & Dawson, 2010). The antecedent stimuli, or prompt, increases the probability of a correct response in the presence of the discriminatory stimulus (Lerman et al., 2016; see p.48). If a child does not respond correctly to a discriminatory stimulus, then prompts are used to help him or her to achieve the correct response.

In behavioural interventions, it is generally acknowledged that prompts should be reduced to ensure that child learning occurs in response to the discriminatory stimulus rather than in response to the prompt. Typically, in DTT, a *most-to-least prompting hierarchy* is used which requires the therapist to deliver the most intrusive prompt (e.g., hand over hand to prompt a child's actions) first so that the child performs the correct behaviours, as in ABA (Lovaas, 1987). However, the delivery of prompts can also be executed in a *least-to-most hierarchy* (as in the ESDM, see Chapter 3; Rogers & Dawson, 2010). Least-to-most prompting ensures that the therapist is providing the least intrusive

prompt first and, if necessary, gradually increasing the level of prompting until the correct behaviour is elicited from the child. According to Rogers and Dawson (2010), this approach can prevent prompt dependence and lead to greater independence and motivation on the part of the child. In the ESDM the skilled practitioner systematically reinforces the child's attempts and always uses least to most prompting hierarchy in every teaching exchange to shape new behaviours, correct errors and promote independence. The least to most prompting hierarchy is also used to facilitate skill acquisition; child initiations; optimizing the child's motivation through the use of contingent reinforcers related directly to the child's goals, preferences, and choices; and interspersing novel tasks with acquired tasks to optimize motivation (Vinti & Stahmer, 2020).

Research suggests that both these prompt fading methods can be effective, although there may be certain advantages and disadvantages to each method for specific children and situations (MacDuff et al., 2001). For example, most-to-least prompting, which is standard in behavioural interventions, might be best suited for helping children with ASD quickly acquire new skills by minimising errors, whereas least-to-most prompting may prevent children from becoming overly dependent on the prompt and provide the opportunity to initiate spontaneous or independent responses, thereby potentially sustaining the impact and generalisability of learned skills.

### **2.5.3 Early Intensive Behavioural Intervention (EIBI)**

Early Intensive Behavioural Interventions are also based on the principles of ABA and are generally delivered at an intensity of 20 to 40 hours per week, which is one of their distinguishing features and one that may prevent them be implemented outside of highly structured settings (Reichow et al., 2018). Extensive research, including replication of studies in the field of EIBIs, has helped researchers, practitioners, and parents to greatly increase their expectations of improvement in children with ASD. Many studies have been published comparing the effectiveness of EIBIs with treatment in the community, or less intensive interventions (Lerman et al., 2016). Generally, these studies found that children who received EIBI had significantly better outcomes across a range of developmental domains including intellectual functioning, language, adaptive behaviour, and social

skills than did the treatment in the community groups. However, Koegel, Ashbaugh and Koegel (2016) suggest possible limitations with EIBIs due to their requirement of highly structured teaching environments, which could make it difficult to generalize any gains made in the therapy session to more natural settings and people. These structural requirements also mean that it is hard to deliver the intervention outside of specialised settings and make it difficult or impossible to use in a truly inclusive manner.

#### **2.5.4 Eclectic interventions based in community, mainstream ECEC settings**

There have been a number of evaluations of early interventions based in mainstream ECEC settings. While these interventions have diverse characteristics, they are presented here together because of their specific relevance for inclusive intervention approaches, and because they are specifically informative regarding the importance of implementation fidelity. These approaches include: Learning Experiences and Alternative Program (LEAP) for Preschool children and their Parents (Strain & Bovey, 2011); Joint Attention and Symbolic Play Engagement and Regulation (JASPER; Lawton & Kasari, 2012); Treatment and Education of Autistic and Related Communication Handicapped Children program (TEACH; D'Elia et al., 2014); and Comprehensive Autism Program (CAP; Young et al., 2016). Results from each of these studies highlight the value of mainstream educational interventions with reported positive impact on child outcomes.

However, when evaluating these eclectic approaches, it is important to note, as identified by Ospina et al., (2008), that fidelity of implementation is necessary to demonstrate when positive outcomes are the direct result of the intervention that has been applied. In accordance with this claim, Chang et al., (2016) found that fidelity of implementation is the variable that is most often compromised in the replication of interventions across settings, particularly when transferred from a specialized setting to an applied setting. In addition, Stahmer et al., (2015) has demonstrated that child outcomes are directly impacted by fidelity of implementation with only four of the afore mentioned studies measuring fidelity of implementation, highlighting a significant limitation within the research: These include: JASPER – evaluated by Lawton and Kasari (2012) to demonstrate the effects of

training regular preschool teachers to implement this intervention in mainstream preschool setting; Enhanced Milieu Teaching (EMT) – evaluated by Olive et al., (2007) investigating the effects of teacher-implemented EMT combined with a voice output communication aid for three children with a diagnosis of ASD in a mainstream preschool setting; LEAP – evaluated by Strain and Bovey (2011) examining the impact of training and coaching on the fidelity of implementation by teachers of the LEAP program and its effect on the outcomes of children with ASD; and CAP – evaluated by Young and colleagues (2016) comparing teacher-implemented CAP with treatment as usual for preschool children with ASD attending mainstream preschools. Results of these studies indicated that teachers were able to implement interventions at medium to high levels of fidelity.

A critical component of the ESDM intervention, which forms the basis of the study presented in Chapter 3 and is used as the basis for One of the Kids PLP presented across Chapters 5 and 6, is its comprehensive and well-researched fidelity of implementation tool which measures optimal delivery of its intervention to young children with ASD across multiple settings (Rogers & Dawson, 2010). The ESDM is discussed in more detail in Chapter 3.

### **2.5.5 Developmental Interventions**

Developmental interventions, while incorporating some principles from behavioural interventions, draw primarily on cognitive social constructivist theories that suggest children construct knowledge and skills primarily through personal discovery. From a constructivist perspective, children acquire knowledge, skills, and experience through their interactions with people and in everyday settings, and this gradually improves their capacity to engage in increasingly complex tasks (Whitehouse et al., 2020). Constructivist theories focus on children’s acquisition of knowledge and skills over time and as part of typical stages of development (Piaget & Inhelder, 1969). ~~This has led to the term *developmental* being commonly used in the ASD research literature to refer to interventions.~~

According to Schreibman (2015), developmental interventions are informed by a constructivist approach to development that dates back to 1952, when Piaget suggested that learning occurs via the processing of new experiences based on current understandings that can only be changed by ~~the~~ new experiences (Schreibman, 2015). Based on this assumption, learning could only

be optimised by scaffolding children's experiences; that is, creating instructional experiences that are slightly more difficult than the child's current level of cognitive development (Feldman & Fataar, 2014). This concept of scaffolding, which refers to those skills that the learner is close to mastering with adult support, aligns with Vygotsky's (1978) Zone of Proximal Development (ZPD). The ZPD has been defined as, "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p.86). This construct is also reliant on the adult working with the child to carefully alternate between what the child can do and what they need to be able to do, so that the child is always experiencing a measure of success, making it more likely for him/her to be receptive to learning new skills (Rogers & Dawson., 2010).

These comprehensive interventions place the emphasis on optimisation of learning occurring as a result of affectively rich social relationships between the child with ASD and their parent or therapist (Dawson & Bernier, 2013). The rationale for this is referred to as the "social motivation hypothesis", which suggests that the brains of children with ASD do not have the same social reward response during social interaction as those of children without ASD (Dawson et al., 2012). Therefore, these interventions use strategies to explicitly promote the sharing of rich and positive affect to increase the child's motivation to engage socially with a play partner (Bauminger et al., 2010). Developmental interventions do rely on the adult's ability to feel and show positive affect and to model this in social interactions. ~~While there is evidence to support these interventions and many commonalities between them, it now evident that the ESDM is by far the most rigorously researched intervention based on developmental principles.~~

The Denver model was developed in the 1980s for children with ASD and other neurodevelopmental disabilities (Rogers & Dawson, 1987). It is a comprehensive intervention focusing on both developmental and relationship-based principles. It was designed specifically for children from 24 months to 72 months attending modified preschool programs with a staff to child ratio of 1:2 (Rogers & DiLalla, 1991). Play was utilised as the "primary vehicle for communicative, cognitive, and social/emotional development for all children" (Rogers et al., 1986, p.136) and

incorporated typical early childhood games, songs and finger plays such as peekaboo and pat-a-cake, thereby enabling the teachers to target the full range of developmental skills (Rogers et al., 1986). This feature is characteristic of all comprehensive interventions, which combined with other critical features previously outlined, add weight to their effectiveness.

The Denver model was tested in naturalistic preschool programs so that skills could be targeted during regular play routines (Rogers et al., 1986). The preschool classrooms were altered in their structure and routines by allocating a *primary teacher* to each child with whom they interacted the most frequently. Skills were targeted during play routines as the developers believed that play was the primary medium for communicative, cognitive, and social/emotional development in all children (Rogers et al., 1986, p.136). These shifts in structure were designed to optimise the child's ability to attend to the teacher and transition easily between activities (Rogers et al., 1987). Maladaptive behaviours were addressed through redirection and the prompting of pro-social behaviours (Rogers et al., 1986). Particular attention was given to imitation and symbolic play in this model because Rogers (1986) believed that deficits in these areas prevented children with ASD from the observational learning that would normally occur in the natural environment of a preschool, attended by a mix of children, including typically developing children (Rogers & Pennington, 1991). It was hoped that this type of a naturalistic setting would also support generalisation of skills due to the greater responsiveness of typically developing peers (Vivanti et al., 2013).

Whilst the Denver model was in many respects well suited to mainstream settings, the challenge lies in an attempt to align such a naturalistic way of thinking about intervention with the rigour and fidelity measures outlined by Roberts and colleagues (2016; see section 2.4.3. To this end, further investigation of applying evidence-based practice to more naturalistic settings is a worthy goal that will be explored in great depth in Chapter 6. Developers of the Denver model responded to this challenge by further research into ASD intervention approaches demonstrating adequate rigour, with the aim of developing an approach that integrated these components and would lead to a model that was based on stronger evidence. This is presented in detail in Chapter 3.

### **2.5.6 Naturalistic Behavioural Early Intervention**

This intervention category was proposed in 2015 to describe several intervention approaches emerging from previous behavioural and developmental theories (Schreibman et al. 2015). Each of the NDBIs share similarities in terms of the nature of learning targets, contexts, and strategies. While they are a recent form of early intervention, they have been prioritised as the most effective intervention for young children with ASD and their families (Roberts et al., 2016). According to Schreibman et al. (2015), naturalistic behavioural interventions (NBIs) were developed as an outcome of previous interventions that lacked a focus on optimising child motivation and spontaneity, such as Applied Behaviour Analysis (ABA). There is an additional focus in NBIs on the generalisation of skills, across people and settings, because of the importance of promoting independent child functioning across multiple settings, following mastery of each skill. Within NBI approaches, it is not simply enough for the child to be able to perform certain skills with one adult in one setting. (Schreibman, 2015). Instead, skills are taught in the context of naturally occurring activities, such as play or daily routines, rather than in a contrived context. Further differences include the use of natural reinforcers that are directly related to the target behaviour which are delivered for correct child behaviours, and child choice of activities and reinforcers are promoted (Koegel & Williams, 1980).

The most thoroughly researched comprehensive naturalistic behavioural intervention for children with ASD is Pivotal Response Treatment (Koegel & Egel, 1979). Pivotal Response Training (PRT) was developed in the late 1970s and involves a comprehensive intervention designed to target ‘pivotal areas’ of a child’s development including child initiations, self-regulation, response to multiple cues, and empathy will lead to exponential gains in other areas, such as social skills, communication and a reduction of problem behaviour. (Koegel et al., 2016). It aims to increase motivation for children with ASD to make attempts and experience success across a range of developmentally and socially appropriate tasks with the desired outcome of building the child’s understanding of the relationship between attempting a task and gaining reinforcement for that attempt (Koegel & Egel, 1979).

There are five procedures in PRT that have been specifically developed to achieve these aims and are incorporated in subsequent early intervention approaches. The reason for this relates to optimisation of child motivation to perform a specific teaching task multiple times, as this can result in mastery. Offering the child choices is a very important aspect of optimising child motivation, as is

using natural and contingent reinforcers that relate directly to the child's behaviour and reinforcing all attempts, so the child is more likely to keep trying. In addition to these factors is the importance of varying the tasks to create both flexibility across materials and activities and building the child's capacity to respond to a range of different stimuli. Finally, interspersing acquisition trials with maintenance trials allows the child to keep feeling successful and thereby more likely to try new skills. (Koegel et al., 2016). Compared to earlier intervention approaches, PRT draws on a sound evidence-base and has strong support as an effective intervention for children with ASD (National Autism Centre, 2015)

PRT is based on the assumption that children with developmental delays experience a learned helplessness in certain situations, rendering them less motivated to exert control in subsequent situations (Hiroto & Seligman, 1975). Learned helplessness theories have implications for individuals with ASD who present with delays across many areas of development (Kennedy & Courchesne, 2008). The consistent lack of success experienced by children with ASD can foster a sense of helplessness which in turn influences the likelihood of future attempts at engagement. For example, if a child experiences difficulties with social interactions, their attempts to interact will not be responded to by peers, and therefore not reinforced. Such reductions in the frequency of social interactions (Koegel et al., 2016) highlights the need for interventions that address the motivational components of children's behaviour.

### **2.5.7 Naturalistic Developmental Behavioural Early Interventions (NDBIs)**

Naturalistic Developmental Behaviour Early Intervention has emerged from the fusion of behavioural and developmental approaches and theories, but they differ considerably in their application. They are applied in a way that harnesses the importance of developmentally appropriate adult-child interactions within the natural context of play and daily activities and routines. These natural learning contexts are utilised because they can promote multiple spontaneous opportunities for social engagement and dyadic exchanges between adult and child (Schreibman et al., 2015). The unprecedented growth in ASD research over the past decade has led to multiple clinical trials testing the validity of NDBIs (Gengoux et al., 2019; Kasari et al., 2014; Wetherby et al., 2014), which are emerging as the most promising approach for integration with mainstream ECEC services.



As noted, NDBIs use principles from each of the intervention methods previously described in this chapter. In particular, the principles of applied behaviour analysis are emphasised to target developmentally appropriate goals within play and daily routines, while embedded in the least restrictive natural environment (Schreibman et al., 2015). However, each of the NDBI approaches vary in terms of the types of antecedents used to elicit behaviours and the method of prompting the behaviour (Schreibman et al., 2015).

NDBIs incorporate ABA procedures, including the use of the Antecedent Behaviour Consequence chains which refers to the clarity, frequency, and developmental appropriateness of the teaching interactions, during an activity. In skilful teaching, the antecedents, child behaviours, and delivery of logical and contingent consequences stand out clearly, so it is easy to see which behaviours are being elicited and reinforced. In this type of teaching repetitions are well matched to the child's learning needs and new skills receive more repetition than mastered skills without loss of child motivation, an important condition for supporting child engagement (Rogers & Dawson, 2010). Other procedures incorporated in NDBIs include selection of observable, measurable child behaviour objectives, and data collected against these objectives. This way, child progress is always readily observable. This approach to intervention allows for more proximal measures of child response to adult teaching, which in turn, may provide more useful information on the impact of such teaching. This could then be linked more directly to the fidelity of implementation, which is not only an important criterion in evidence-based interventions (Rogers et al., 2018), but could also inform professional learning practices and procedures (Vivanti & Stahmer, 2018). The extrapolation of this information is of critical importance when intervention is delivered in community settings, such as ECECs by non-specialist staff, as the fidelity of implementation is likely to be variable (Vivanti et al., 2021). According to Vivanti and colleagues (2020), fidelity of implementation plays a critical role in a child's response to the teaching of new skills, highlighting the importance of training staff to a high level of fidelity in interventions for children with ASD.

Like PRT, all NDBIs target skills in the context of play and routines, use natural reinforcers, and promote child choice (Koegel et al., 2016). NDBIs also incorporate other procedures from PRT, such as task variation and reinforcing attempts (Schreibman et al., 2015), however, child learning objectives are drawn from developmental checklists based on typical child development (Schreibman et al., 2015). Using typical development as a guide can also ensure a greater understanding of child development and that

realistic expectations are expected by the adult (Schreibman et al., 2015). There is also a focus on teaching skills which are foundational to further social and communication development, such as imitation, joint attention and eye contact, gestures, and intentional vocalisations. This type of teaching draws the child's attention to social stimuli and makes it socially rewarding by engaging the child in positive emotional experiences with others. These strategies allow the adult to elicit greater social and communicative behaviours from the child, shaping his/her neural networks into developing a greater responsiveness to social partners (Rogers & Dawson, 2010). This also highlights the need for positive peer connections with socially competent role models in the intervention process. When children with ASD have opportunities to practice and master their developing social skills during interactions with typically developing peers, who are likely to be more responsive to their social overtures, this could result in improvements on the critical domains of communication, imitation and joint attention (Vivanti et al., 2021).

NDBIs use operant conditioning principles to promote the development of socially important behaviours in the context of naturalistic and socially engaging routines that incorporate children's choices and materials. The environment is arranged to facilitate child initiated interactions and so the child experiences the natural consequences of his or her self-initiated behaviour. Intervention targets are carefully scaffolded to incorporate developmental sequences and prerequisites for the development of specific skills (e.g., joint attention, imitation, and functional play as key precursors to language), to enable the child to participate in experiences that will enhance his or her learning. Additional elements shared by NDBIs include the manualisation of procedures for treatment delivery, fidelity monitoring, and measurement of child progress (Bruinsma et al., 2020; cited in Vivanti & Stahmer, 2020). These additional elements may also support adults delivering intervention in inclusive settings, given the prescriptive nature of manualisation and the clear expectations implicit in fidelity tools, supporting consensus across a team approach.

NDBIs use an approach to teaching that is rich in positive affective and social interactions (Schreibman et al., 2015). The relationship-based strategies used in NDBIs of positive affect and increased social reward value are effective for young children with ASD (Dawson, 2008). Additionally, the inclusion of behavioural teaching principles is intended to increase the probability that the intervention will be effective by improving a range of behaviours in young children with ASD (Lerman et al., 2016). Some examples of NDBIs gaining traction around the world include: JASPER (i.e., joint attention, symbolic

play, engagement, and regulation), which is a targeted treatment focussing mainly on shared affect and shared meaning (Kasari et al., 2010); SCERTS (i.e., social communication, emotional regulation, transactional support), which focuses on building competence in social communication, emotional regulation, and transactional support (Wetherby et al., 2014); and the ESDM, which focuses on building communication skills by optimising child motivation and increasing the reinforcement value of social interaction, so that children learn adaptive ways of having their needs met (Rogers & Dawson., 2010). Like JASPER and SCERTS, the ESDM gives particular focus to the critical skills of social attention, affect sharing, imitation, and joint attention. The effectiveness of each of these in improving outcomes for young children with ASD lies in strengthening the synapses of the brain linked to social and communication areas, so that the child with ASD quickly learns that people can be fun play partners and worth attending to and learning from, an approach that is gaining empirical support (Ingersoll & Wainer, 2013; Kasari et al., 2014; Wetherby et al., 2014; Talbott et al., 2016).

### **2.5.8 Summary: Features of effective intervention**

A review of the different approaches to intervention shows there are a number of key features necessary for intervention success and sustainable behavioural shifts in the child with ASD. While all interventions share a common goal of improving a person's life experience (Sandbank et al., 2020), it is important to identify the evidence-based features that help children develop new skills across the range of developmental domains and reduce the behaviours that are perceived as barriers to their inclusion in community settings. These features have been drawn from research critiqued in this section and are summarised here.

Firstly, there is a need for intervention approaches to optimise child motivation for learning and to promote child independence, as these are essential elements of learning for all children, enabling to function successfully across multiple settings, with multiple people. Offering child choice and identifying the child's spotlight of attention, allowing them to lead you into an activity facilitates motivation; as does ensuring that acquisition goals are always interspersed with maintenance goals so that the child continues to feel a level of success and motivated to continue (Rogers & Dawson, 2010)

Secondly, to ensure relevance, individualisation and rigour in the intervention approach, a treatment plan, or program of goals should be developed directly from comprehensive child

assessment. The intervention goals should then be embedded in child-initiated teaching episodes or routines with a focus on intrinsic reinforcement, such as social reward, rather than external reinforcers, as this has been shown to encourage further attempts at new skills and behaviours, as well as increasing the social reward factor for children with ASD (Talbot et al., 2016). These child goals need to be subjected to regular and ongoing measurement of the child's progress towards their achievement, allowing adjustments to be made where necessary, particularly in the face of slow progress. Of equal importance here is the need to subject the adults delivering intervention to fidelity of implementation checks, to ensure that the intervention is being delivered as intended. All of these features are contingent upon a comprehensive manual to guide implementation on all levels. This will also help to ensure that all adults on the intervention team are using a consistent approach (Schreibman et al., 2015).

Finally, because children with ASD need to be brought back into the social loop at every opportunity, so that their focus on objects is redirected to people from whom they can learn, the learning environment needs to be arranged in such a way as to promote social interaction through play and routine-based activities that promote learning and development in a naturalistic setting. When adult modelling, acknowledgment, elaboration, and imitation of child actions are built into every teaching episode, the child will develop the necessary skills of turn taking, attending to others, and initiating the continuation of play, which in turn will help to broaden their otherwise restricted and repetitive play skills and interests. (Schreibman et al., 2015).

In sum, the accumulating evidence on ASD intervention, together with principles of EBP and a need to respond to children in mainstream services, give a clear directionality to prioritising NDBIs and ensuring that they can be effectively implemented in everyday settings with fidelity. A key component of this transition in intervention practice is that children, families and educators experience inclusive environments, which is discussed below in section 2.6

## **2.6 Inclusive Intervention**

All interventions share the philosophy of advancing the human rights of the child for justice, education, inclusion and full participation consistent with a disability rights perspective (United

Nations, 2006; cited Whitehouse et al., 2020). The United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2006) states it is a fundamental human right that every child should have “full and effective participation and inclusion in society” (Article 3). Further, ‘there should be a fostering at all levels of the education system, including in all children from an early age, an attitude of respect for the rights of persons with disabilities’ (Article 8).

At a legislative level, there is a critical need to translate evidence-based ASD interventions into sustainable community practice highlighting the practical and economic arguments for providing more inclusive interventions and supports to children on the autism spectrum. While these arguments focus on children’s potential and the advantages of early investment in child development for promoting both immediate and long-term social and economic benefits (Whitehouse et al., 2020), they also highlight the many challenges involved. The savings in public spending that may result from inclusive intervention should not destabilise the principle focus of increasing the participation of the individual receiving that intervention. It was in this context that the National Disability Insurance Scheme (NDIS) was created through a partnership between the Commonwealth and State Governments of Australia (Whitehouse et al., 2020). However, the guidelines for intervention supports under the NDIS give very little attention to funding inclusive interventions which may lead to improved outcomes for children with disabilities and their families, as well as bringing savings to public spending in the long-term (Productivity Commission, 2017). These arguments point to public investment in inclusive intervention for children on the autism spectrum, if there is empirical evidence that this type of intervention may lead to the desired outcomes. While literature on inclusion dealing with the inclusion of children with ASD has increased in recent years, it remains limited. Further, the implementation of inclusion internationally, has preceded research for its validity (Waddington & Reed, 2016). It has been argued that inclusion of children with ASD will improve their quality of life, educational success, and social development. However, recent debates over governmental policies regarding inclusion make investigating the success of inclusion an important area for research and practice (Waddington & Reed, 2016).

The inclusive setting can present many challenges for teachers and children with and without ASD and their parents. One way of exploring these challenges is through a disability perspectives

framework enabling a deeper understanding of the diversity of perspectives and attitudes around inclusion. According to Mackenzie et al (2016) inclusion can be categorised into three broad areas including: a medical perspective, a social perspective and a social-relational perspective. The medical perspective highlights the attitude that children with ASD have an impairment that needs to be cured, allowing only a focus on the need to change the child to fit their setting (Oliver & Barnes, 2012). This perspective leads to attitudes that cause exclusion and segregation of the child with ASD and highlights the need for a different way of thinking and perceiving the child, so they can be included effectively. The medical perspective contrasts sharply with attitudes that stem from a social relational perspective, that prioritises the need for enabling environments and pedagogical practices that facilitate all children's full participation, regardless of impairment (Cologon & Thomas, 2014). This approach leads to attitudes that minimise the negative impact on that child and their family by dismantling barriers to inclusion through adaptations to environments and pedagogies.

The current focus on more naturalistic intervention models coupled with a paradigm shift from segregated to inclusive education, highlights the need for a more inclusive and ecologically valid approach to educating the child with ASD. The question of whether children with ASD should be educated in segregated or inclusive mainstream services has been long debated (Pellicano et al., 2018). Consideration of human rights, in this debate, highlights recommendations on the education of a child with a disability occurring in the least restrictive environment that includes opportunities for interactions with typically developing peers (United Nations, 2006). Current policies and legislation in Australia are compliant with human rights movements expressed in international conventions and charters, including the Salamanca Statement (UNESCO, 1994) and the Convention on the Rights of Persons with Disabilities (Chireshe, 2013).

Australia's first National Quality Framework (NQF) for early childhood (ACECQA, 2011) provides a number of guiding documents to support the inclusion of all children in Early Childhood Education and Care (ECEC) services. Educators are encouraged to have high expectations of all children, including those with disabilities, in line with the current regulations identifying that inclusive practices must be followed (ACECQA, 2011). As a core part of the NQF, the Early Years Learning Framework (EYLF) provides "a strong theoretical and philosophical foundation for

respecting diversity and acting for equity and inclusion of all children” (Warren et al., 2016, p.19).

These principles are reflected in some of the standards of the EYLF with particular reference to a child-centred focus that highlights the need for assessment and planning so there is a clear recognition of each child’s different abilities and interests so that adaptations can be made to the program and physical environment to support their full participation (ACECQA, 2011).

Attendance at mainstream early childhood education services, including preschool and long day care programs, is a common early life experience for many Australian children (ABS, 2021). In Australia, the Federal Government Department of Education, Employment and Workplace Relations (DEEWR) supports and regulates long day care. DEEWR also encourages adherence to principles of social inclusion and subsidy schemes to support the engagement of children with disabilities in these services. These schemes are complex and poorly understood by most staff and parents (Wong & Turner, 2014). The prevalence of childhood disability at 7.4% (ABS, 2019) suggests that there are many children who could be involved in attending ECECs. For some children with ASD, participation in ECECs may be their only opportunity to participate in a regular form of early intervention. This is the result of long waiting lists for other interventions provided by public health and other government and non-government agencies (McGill et al., 2021). For children living remotely from services and from allied health interventions, a mainstream early childhood education service might be the only form of readily available early intervention. The experiences of some parents in regional Australia reveal that the ECEC sector was unresponsive to their needs and that ‘where you live affects your access to quality care’ (Harris & Tinning, 2012, p. 14). Additionally, an investigation of consumer perceptions of barriers to accessing paediatric speech pathology services in rural and remote NSW, found limited choice, long distances and expense of travel, waiting lists and poor awareness of speech pathology (Woolfenden et al., 2012). Whilst referral to a paediatrician or speech pathologist is conventionally accepted practice, the relative absence of referrals to mainstream ECECs could be a missed opportunity for children and families to engage in a potentially more available form of intervention and other support services (Woolfenden et al., 2012). This scenario applies even more pressure on mainstream ECECs to take on the role of intervention for children with ASD.

While debate over inclusion includes human rights considerations related to the inclusive or segregated education of children with ASD, it must also address the impact of inclusive versus specialist settings in terms of feasible and effective delivery of ASD intervention programs (Vivanti et al., 2018). According to Vivanti and colleagues, a critical goal of inclusion should be the provision of opportunities for children with ASD to participate fully in mainstream educational settings that are free of discrimination and negative attitudes. Another important goal of inclusion could be to provide opportunities for typically developing children to learn about diversity among peers in the hope that they may learn to become more accepting in the early years (Vivanti et al., 2018). The belief that children with disabilities should participate alongside their typically developing peers within naturalistic ECEC settings is a shared value for many ECEC professionals (Warren et al., 2016). In contrast to segregated settings, inclusive settings provide many opportunities for children with ASD to practice and generalise their new skills via responsive social interactions with typically developing peers (Vivanti et al., 2018). This type of interaction with role modelling from competent peers could benefit children with ASD across several developmental domains, such as communication, imitation and joint attention (Little, 2017).

Despite the potential benefits of inclusion, Australian research continues to highlight the ongoing challenges experienced by educators in their attempts to include children with ASD within mainstream settings (Mackenzie et al., 2016). Approaches to inclusion therefore need to consider both facilitators and barriers to effective implementation of inclusive practices.

### **2.6.1 Barriers to inclusive intervention**

Whilst the prevailing framework for ECEC and early intervention strongly advances inclusive practices, it is important to consider contrasting arguments that support segregated settings, as these could form the basis of many of the barriers to effective inclusion. The idea that children with ASD might be better accommodated in autism specific settings designed to address their unique educational needs is worthy of consideration, as is the possibility of preventing peer rejection that could lead to increased social difficulties (Vivanti et al., 2018). Of equal concern are the demands that children with ASD place on regular educators in mainstream settings, potentially reducing their attention and focus



on the educational needs of other children in the group (Hornby, 2014). Unfortunately, there appears to be a lack of conclusive evidence relating to the benefits of inclusive settings over specialist settings, highlighting the need for further evaluation (Vivanti et al., 2018).

Research examining approaches to the inclusion of children with ASD have cited a number of barriers: i) lack of specialist pre-service professional development; ii) insufficient knowledge and understanding of ASD and its impact on a child's development and behaviour; iii) ECEC leadership that does not promote or support inclusive practices and; iv) high child:staff ratios across the ECEC sector (Grace et al., 2008). According to Cologon and Thomas (2014), these barriers can be categorised in three distinct ways, incorporating socially imposed restrictions that prevent full participation, negative impact of words and actions that impact on a sense of self and the direct and unavoidable impact of the impairment restricting the child's ability to live in the social world (Cologon & Thomas, 2014). This relates back to the lived experience of disability, providing a deeper understanding of the negative impact resulting from exclusion of children with an impairment. A recent report on interventions for toddlers and young children with ASD, ~~however~~, found that natural settings, such as mainstream ECECs were not the primary intervention venue in most cases and that the majority of children spent more time in non-natural settings, places where the majority of their peers also had ASD (Schertz et al., 2011). This could have the potential to minimise social and communication experiences as well as the learning opportunities that come through high quality play-based pedagogies.

## **2.6.2 Maladaptive behaviours as a barrier to inclusive intervention**

Maladaptive behaviour, such as aggression, tantrums, screaming, marked fussing self-injury or significant stereotypies, can significantly reduce a child's access to learning opportunities and interactions with others (Rogers & Dawson, 2010) while at the same time impacting negatively on parental psychological wellbeing (Allik et al., 2006; Bromley et al., 2004; Davis & Carter, 2008). Maladaptive behaviours are particularly problematic in group-based settings as they can be disruptive to the overall program and pose significant challenges to the children with ASD themselves, their peers, and staff. Other children can be overwhelmed by the intensity of a maladaptive behaviour and

staff can become anxious and quite stressed, reducing their ability to understand and manage these behaviours effectively and efficiently. Unsurprisingly, this is why maladaptive behaviours are amongst the most commonly identified barriers to the inclusion of children with ASD in ECEC settings (Grace et al., 2008). It is therefore critical to adopt a comprehensive intervention approach that both addresses the critical issue of maladaptive behaviour, while also addressing the need for implementation across all settings in which the children with ASD may be participating. Such a universal approach would be more likely to reduce this significant barrier to their inclusion.

### **2.6.3 Parent perspectives on barriers to inclusive intervention**

As parents are key stakeholders in regard to inclusion of children with ASD, we need to embed and consider their voice as part of the intervention process. Although there is not a lot of literature on parent perspectives in prior to school settings, the studies that do exist highlight significant variability in parents' views on the value and benefits of inclusive education. This highlights the complex and multi-faceted perspectives of these important stakeholders. Parents who believe in an inclusive setting for their child with a disability are confident that it will improve their child's independence, provide opportunities to learn by observing typically developing peers, build their self-esteem, improve their functional day-to-day living skills, provide opportunities to participate in creative and interesting activities, and improve community understanding and acceptance of children with disabilities (Garrick-Duhaney & Salend, 2000). In contrast, parents who don't believe an inclusive setting will benefit their child express concern about the possibility of social exclusion (i.e. peer rejection) and they perceive this as a risk associated with mainstream ECEC attendance, leading to a negative impact on their child's sense of emotional wellbeing (Hewitt-Taylor, 2008). Despite increasing support at the policy level for inclusive early childhood education, families continue to encounter many challenges in securing a place for their child at an educational setting that is both willing and able to meet their child's needs.

Parent decision making about inclusion is complex, embedded in the social context and influenced by a mixture of contingencies arising from family and working life. This might mean that parents make choices that are pragmatic and based on availability, rather than on how a service might

be able to meet the needs of their child. An earlier UK study on the barriers to inclusion, for example, found that parents who aligned themselves with a social relational model perspective were far more likely to seek inclusive educational settings for their child with ASD (Runswick-Cole, 2008). In contrast, parents who aligned themselves with a medical model perspective were far more likely to seek out segregated educational settings (Runswick-Cole, 2008).

Parental choice has been referred to as child-care “usage” because parents frequently do not choose from a wide range of options (Ceglowski et al., 2009), or they may have limited knowledge around what they should be looking for in terms of meeting their child’s needs, or they may simply have different priorities for their child. One of the most significant barriers to inclusion from the parent perspectives was finding a mainstream service that was willing to offer their child a placement, without significant levels of persistence on their part (Grace et al., 2008). Grace and colleagues (2008) found much frustration on the part of parents in the mainstream sector at the enrolment stage, in regard to maintaining relationships with centre staff and with ongoing involvement. This study found mothers seeking normal early childhood experiences for their child were often willing to accept low staff knowledge and training in order to have their child included/enrolled. Few mothers in this study believed their child was happy, loved or included.

The value of educator-parent partnerships is further reinforced by findings which speak to the developmental benefits for children when parents feel supported and connected with the ECEC context. Schertz et al (2011) found that services that support families, rather than focussing on child developmental change alone have experienced some of the best outcomes for children with ASD. Such family centred interventions are complemented by the use of mainstream early childhood settings where non-autistic peers attend. Interventions that focus exclusively on child changes without meaningful family involvement may, in fact, compromise outcomes because, in addition to lower levels of parental depression, higher levels of parental involvement are associated with their increased knowledge of ASD, increased parent–child interaction, and improved outcomes for children with ASD (Schertz et al., 2011). Understanding parental perspectives on the enablers for inclusive intervention is also likely to enhance educator practice.

The dearth of parental perspectives in the early childhood inclusion highlights the need for further studies in this area, with a particular focus on the perspectives of parents who have a child with ASD. Whilst many studies concentrating on inclusion find similar themes amongst parents in what motivates them to enrol their children with disabilities and what their fears and concerns are, few studies have explored how developmental change is perceived to come about when it has been achieved. This parental perception and the need to embed the parent voice in the intervention process, was the impetus for the second study contained in Chapter 4.

#### **2.6.4 Educator's perspectives on barriers to inclusion**

Research conducted with educators has revealed some concerns around the efficacy of inclusive education with research by Hornby and colleagues (2014) showing many mainstream educators believed inclusion does not work for all children and believed in the continued need for specialist educational settings that were better equipped to address the specific needs of children with ASD. Even though inclusion versus segregation remains a highly contested debate for parents and professionals, there is no definitive research evidence to suggest that segregated educational settings have better learning outcomes for children than inclusive educational settings (Vivanti et al., 2018). In fact, research dating back to the 1960s has demonstrated that the outcomes of inclusive education are equal to, or greater than, those of segregated education (Mackenzie, et al., 2016). From a socially inclusive perspective, Kishida and Kemp (2009) found that children with ASD interacted twice as much with their peers in an inclusive, than in a segregated setting and furthermore, the quality of the interactions was rated positively in the inclusive setting and negatively in the segregated setting. According to Mackenzie et al (2016), the notion of inclusive education not being appropriate for all children may stem from the intensive behavioural interventions that have been popularly used as a treatment for children with ASD for many years now. These intensive interventions require specialist expertise in their delivery and because they were not naturalistic interventions, they may not appear suitable for the play-based pedagogy of inclusive ECEC setting. An equally valid explanation for the lack of support for inclusive education may stem from educators' feelings of inadequacy or a lack of knowledge as to how to effectively support children within their setting. Indeed, mainstream

educators have raised concerns about their lack of professional development directly related to ASD (Bene et al., 2014) and some even have misconceptions about ASD (Segall & Campbell, 2012).

The effectiveness of interventions for children with ASD, hinges in part, with educators' professional knowledge and skills (Pellecchia et al., 2015). Children with ASD have been found to benefit from the opportunities ECEC services provide for observational learning and behaviour modelling of their typically developing peers (Rogers & Dawson, 2010; Taylor & DeQuinzio, 2012). However, these opportunities can only be facilitated by an understanding of the impact of a child's environment on the development of ASD. Unfortunately, research has demonstrated that mainstream educators generally don't have the specialist skills or training to equip them with this level of understanding. Therefore these opportunities can be missed (NSW Disability Strategy, 2018). In addition to their perceived lack of preparation for inclusion of children with ASD, many educators have reported that they lack adequate support and resources, in terms of additional staff and specialised equipment within their services to manage the inclusion of children with ASD (Mandell et al., 2013) and have indicated a desire for greater levels of collaboration with relevant professionals who have expertise around ASD to support the inclusion process (Finke et al., 2009).

### **2.6.5 Service quality as a barrier to inclusion**

A body of research literature underscores the important role of high-quality ECEC in shaping children's socio-emotional, cognitive, communication and language development (Lazzari & Vandebroek, 2012). Quality of ECEC is linked to positive child developmental outcomes and positive functioning within the service setting that can be generalised on a longer-term basis (Siraj et al., 2015). However, enrolment in ECEC alone does not guarantee a quality experience nor does it necessarily guarantee inclusive practice unless the service prioritises quality practices such as the range of adaptations and pedagogical practices that lead to high levels of participation for children with ASD alongside their typically developing peers. An inclusive setting such as this may have a positive impact on child development in the areas of cognition, communication and motor skills. This type of inclusive setting would promote a sense of belonging, social engagement, social acceptance, and friendships are realistic and meaningful outcomes (Odom et al., 2011). It could even be argued

that mainstream early childhood education services should be regarded, more broadly, as providers of early intervention for children with ASD. That all young children have the potential to learn, grow and develop is the underlying assumption on which early childhood education is based. The *Victorian Early Years Learning and Development Framework* (2011) states that each child is different and has a unique learning trajectory, meaning that each child will require unique supports to reach his or her full potential. There is a greater likelihood of this happening in a high quality mainstream ECEC (Lazzari & Vandenbroeck, 2012).

### **2.6.6 The impact of ASD on a child's development as a barrier to inclusion**

Crais and colleagues (2004) found typically developing children use eye contact, facial expressions, gestures and vocalisations to connect and communicate and they become very skilled communicators before formal speech develops. Other communication skills, in these early stages include sharing interest, attention and emotions, which serve as “the pragmatic functions of joint attention” (Bruner, 1981). This coordinated attention between infant and caregiver is a precursor to joint attention and foundational to communication development. This is not well developed in young children with ASD. The inability children with ASD have to read’ social cues and share attention with others, can result in isolation from a culture of social interaction (Mundy & Neal, 2001).

Difficulties relating to social communication and interactions make it challenging for the young child with ASD to navigate peer relationships in inclusive settings and social situations (Jones & Frederickson, 2010). To make genuine connections with peers, children with ASD need to develop conventional gestures that they can use to support communicative functions – behaviour regulation (requests and protests), social interaction (beginning and maintaining dyadic social activities), and joint attention (sharing attention with a partner about an object or event). In the absence of social connection and communication, genuine inclusion is not achievable (Rogers & Dawson, 2010). Further barriers to inclusion in mainstream ECEC settings stem from the range of co-existing conditions experienced by children with ASD including emotional and behavioural problems, sleep, feeding and eating problems, sensory sensitivities, learning and intellectual disabilities, as well as co-morbid health and mental health diagnoses (Maskey et al., 2012). Such conditions can be of equal or

greater concern for the educators in these settings than the core features of ASD themselves and have a significant impact on the child's learning and development of social relationships (Pearson et al., 2006).

While the placement of a typically developing child in a mainstream ECEC may have immediate benefits for their social and communication development, the placement of a child with atypical development, such as ASD may not benefit the child's social and communicative development at all, if their educators are not providing them with carefully scaffolded opportunities to learn, practice and master imitation skills and the pragmatic functions of joint attention foundational to communication and social development (Taylor et al., 2015). To this end, the provision of ASD targeted professional development that builds the understanding, skill level and capacity of educators in these settings seems of paramount importance. Without this, the potential benefits of inclusion may not be harnessed.

## **2.7 Summary: Understanding the potentialities of comprehensive and inclusive early interventions in ECEC settings**

Without effective early intervention, ASD has been associated with negative long-term outcomes including lower than expected academic success, limited friendships and peer relationships, and reduced participation in social/recreational activities in adolescence and adulthood (Estes et al., 2011; Orsmond et al., 2004). Many Australian children with ASD do not have access to specialist early intervention services but most of these children do attend mainstream ECEC services (Grace et al., 2014), where it might be possible to provide some type of specialist early intervention. Although there are no studies focused specifically on the implementation of ESDM delivered by mainstream educators in an ECEC setting, there is some, albeit limited, research that speaks to the implementation of other evidence-based comprehensive interventions in these settings (see section 2.5.4).

The ESDM is a comprehensive intervention that could lend itself well to mainstream ECEC settings because it is underpinned by play-based learning, the development of secure and reciprocal relationships, the promotion of all forms of communication, and the following of child interests and

choices. These principles are reflective of the Australian Early Years Learning Framework (EYLF; DEEWR, 2009), acknowledging that a child's earliest development takes place within the context of secure and reciprocal relationships. These relationships are essential for the child to become an involved and confident learner and effective communicator. However, research has demonstrated that working within this framework is not always as achievable for mainstream ECEC settings when endeavouring to include a child with ASD.

In terms of its potential for group delivery of the ESDM, at the time of writing this thesis, research has only evaluated its impact on children attending autism specific early learning and care centres (ASELCCs) with a teacher-to-child ratio of 1:4 (Eapen et al., 2013; Fulton et al., 2014; Vivanti et al., 2014; Vivanti et al., 2018). It is not known whether ESDM can be effectively implemented by regular educators in mainstream ECEC settings working with a significantly higher staff-to-child ratio of 1:8/1:10. The importance of staff ratios needs to be considered within the context of staff qualifications, which is the determinant for measuring ECEC service quality (Melhuish, 2014),

For this reason, the focus needs to be on building educator skills, knowledge, understanding, and confidence to investigate how their existing quality of practice can be enhanced by intensive and targeted professional development and mentoring. The practices of educators have been linked to the level of their qualifications and to the quality of their ongoing professional development (Siraj et al., 2015). The combination of these two factors may well impact on educator ability to facilitate a high level of participation in a wider range of learning experiences for children with ASD in mainstream ECEC settings. However, a more targeted whole team approach that responds to the inherent variations in qualifications and experience within the ECEC context (Jackson, 2020) through specialist professional development may lead to better and more sustainable inclusion of children across mainstream ECEC services than the current situation.

Given the ESDM is classified a Comprehensive Treatment Model (CTM), it was important to identify recent studies evaluating other CTMs implemented by educators in an inclusive ECEC setting. CTMs are defined as any manualised intensive intervention model that are designed to address the core features of ASD and have a clear theoretical or conceptual framework (Odom et al.,



2010). Results from each of these studies demonstrated that these interventions had a positive impact on child outcomes. Fidelity of implementation is necessary to conclude that outcomes are the direct result of the intervention that has been applied (Ospina et al., 2008). It is also the variable that is most often compromised in the replication of interventions across settings, particularly when transferred from a specialized setting to a mainstream setting (Chang et al., 2016). Child outcomes are directly impacted by fidelity of implementation (Stahmer et al., 2015). Of the afore mentioned studies only four incorporated measures of fidelity (see Lawton & Kasari, 2012; Olive et al., 2007; Strain & Bovey, 2011; Young et al., 2016), with findings attesting to the potential for educators in mainstream preschool settings to implement programs with high levels of fidelity following involvement in rigorous evidence-based training. Further, the measurement of fidelity in community based ECEC settings is particularly important as it is common for fidelity to be compromised when an intervention is transferred from a specialist setting to an applied setting (Chang et al., 2016) and research has demonstrated that child outcomes are impacted by fidelity of implementation (Stahmer et al., 2015). An overview of each of the four studies that included a measure of teacher fidelity is presented below.

While results from studies reviewed in this chapter show that comprehensive interventions can be effectively implemented in inclusive mainstream ECECs, further research that includes a clear measure of fidelity of implementation is required to replicate and strengthen existing findings. It is also important that future research in this area considers the social validity of interventions as this is key to their effectiveness and sustainability. A critical component of the ESDM intervention, which served as the basis for this thesis, is its comprehensive and well-researched fidelity of implementation tool which measures optimal delivery of its intervention across multiple settings, to young children with ASD (Rogers & Dawson, 2010). The ESDM builds upon the studies reviewed here in that it has a strong and growing scientific evidence base and is embedded in play and daily routines, rendering its suitability to application in mainstream ECEC settings (Vivanti et al., 2019)

Given the potential value of providing a naturalistic early intervention based on developmental and behavioral principles to young children with ASD, it seems important to evaluate different approaches for supporting early childhood professionals in the implementation of programs based on these principles, such as the ESDM. The Early Start Denver Model of intervention has demonstrated

its ability to do this by reducing maladaptive behaviours in young children with ASD by a statistically significant level. However, this was achieved in a specialist setting designed and staffed specifically for children with ASD. The different aspects of a mainstream setting in terms of staff:child ratios, lack of specialist skills across the staff team and the participation of typically developing peers may well create further challenges. These will be explored in depth in Chapter 7 of this thesis.

An inclusive approach to the delivery of autism interventions is not only socially valid but has the potential to be cost-effective as many children with autism already attend mainstream early childhood education and care (ECEC) settings. Educators in these settings could also be well-suited to implementing interventions for these children because of their pre-service education in learning and development in the early years (Lawton & Kasari, 2012). An inclusive ECEC setting also provides opportunity for children with ASD to develop the social behaviours needed to interact with peers, thus benefitting from the contributions of typically developing peers toward a child's competence in social and communicative domains (Koegel et al., 2001). The play-based pedagogies that permeate quality ECEC settings do lend themselves to some of the more naturalistic early intervention approaches for children with ASD, such as the Early Start Denver Model. The evidence for ESDM efficacy is dealt with in more detail in Chapter 3. Embedding this type of approach could help support children with ASD to participate more fully alongside their typically developing peers, through enabling environments and informed pedagogical practices that facilitate full participation for all children. This is the right of every child.

The final section of this chapter outlines the Early Start Denver Model (ESDM) and several recent reviews into its suitability. Consideration is also given to the aspects of this model which may make it suitable for further application within the early childhood education and care environment, by comparing it to other interventions that have been investigated for their applicability to mainstream education services. Future developments with respect to the professional support for educators within the ECEC sector are also advanced.

## **2.8 The Early Start Denver Model (ESDM) Approach**

The ESDM is a more recent example of a NDBI that is currently attracting much attention worldwide. This approach to intervention for young children with ASD is a manualised, comprehensive play-based approach that integrates Applied Behaviour Analysis (ABA) and PRT with developmental and relationship-based approaches (Rogers & Dawson, 2010). The teaching principles used in this model are informed by expertise from relevant allied health and early childhood education professions. Major treatment targets include skills that enable social learning and engagement in naturalistic social interaction and cooperative activities (e.g., spontaneous imitation, joint engagement, verbal and nonverbal communication) (Rogers et al., 2017, cited in Vivanti et al., 2019). The relevance and applicability of the ESDM to the ECEC context is that it is not tied to a specific delivery setting so can be delivered by multi-disciplinary teams and/or parents, in group programs, clinical settings, or in the child's home, potentially rendering it suitable also for mainstream application (Talbot et al., 2016).

Like PRT, the ESDM incorporates procedures to increase child motivation such as: child choice; task variation; the interspersing of maintenance with acquisition skills to optimise motivation and success; and the use of contingent and natural reinforcers such as the premack principle and visual schedules (Rogers & Dawson, 2010). Skills are targeted through behavioural teaching principles including the Antecedent Behaviour Consequence format and the Instructional Techniques of prompting, fading, shaping, chaining and management of errors (Rogers & Dawson, 2010). All skills are targeted within the context of 'joint activity routines' that provide a clear structure through carefully executing four parts including: set up, theme, elaboration and close down / transition. These routines occur naturally throughout the child's therapy session, daily routines, and play schemas throughout the day, rather than as discrete trials. The joint activity routines are a balance of: i) sensory-social routines such as songs, finger plays, rhyming games, bubbles; ii) object focused routines such as puzzles, blocks, books and playdough, pack-away and; iii) daily living routines such as greetings, snacks, bath-time, bedtime and dressing.

The ESDM also incorporates techniques stemming from the Denver model that are intended for developing positive, affective relationships with children to increase the reward value of social interactions (Dawson, 2008; Rogers & DiLalla, 1991). These techniques include: (i) the use of rich

and genuine positive effect, (ii) an emphasis on the fun element throughout, (iii) imitating the child's actions, gestures and sounds effects, and (iv) sharing control of the interaction between adult and child so that it is balanced, co-constructed and coordinated. There is an emphasis on teaching imitation, which the authors of the ESDM consider to be one of the key ways in which all young children learn new skills, observational learning (Taylor et al., 2015; Rogers & Dawson, 2010).

The role of ESDM in promoting brain development and skill acquisition is in the: (a) teaching of new skills during the period when the brain typically acquires those skills and is most plastic; (b) re-directing the child's attention from objects and unusual details in the environment back to people; (c) facilitating affective engagement throughout all interactions and; (d) delivering a multi-modal and multi-domain approach to teaching so that many areas of the brain are activated at once (Dawson, 2016). The rationale for this approach is based on scientific evidence that demonstrates ASD is associated with reduced neural connections between different parts of the brain. Because complex behaviours such as social interaction and language require such precise coordination among many different brain regions, it is essential that skills across many developmental domains are targeted at the same time (Dawson, 2016). So, teaching episodes in the ESDM are designed to offer multiple learning opportunities across developmental domains simultaneously, including such key behaviours as eye contact for early communication, joint attention, imitation, receptive and expressive communication, fine motor and gross motor together with social and play skills (Dawson, 2016). While the impact and value of the ESDM program has been well established within clinical settings, population impact hinges on initiatives extending beyond specialised settings into mainstream ECEC contexts. The quality mainstream ECEC context is the most naturalistic group setting in which to provide positive early experiences that are rich in affect and multi-modal learning. When a child with ASD is participating in an ECEC program for 6 – 8 hours a day, several days a week, these experiences, along with social engagement with competent role models, could be offered at a frequency and intensity that may positively shape the circuitry of the child's brain. Implementation of the ESDM by early childhood educators should be seen as a natural extension of this approach. The success of the ESDM intervention however, hinges on adults' knowledge of child development and their ability to engage the child with ASD. When practitioners are trained in the ESDM, they learn the

strategies that naturally draw the child's attention towards them and towards their peers supporting social connections and social integration, both important outcomes of inclusion.

Recent reviews investigating the effectiveness of the ESDM (Estes et al., 2015; Tordjman et al., 2015; Bradshaw et al., 2015; Ryberg, 2015; Davlantis et al., 2016; Talbott et al., 2016; Waddington et al., 2016; Vivanti et al., 2016) highlight the effectiveness of the ESDM and its ability to be adapted across multiple settings, indicating that such versatility may be important for increasing opportunities for learning and engagement for children with ASD. Ryberg and colleagues (2015) reviewed eight studies of the ESDM excluding studies with single case designs and concluded that the ESDM was a promising intervention in terms of cognitive and communication gains in children with ASD. The first randomized controlled trial of the ESDM demonstrated that, compared with children receiving community intervention, children receiving the ESDM showed significant gains in visual processing and improvements in language abilities, with subsequent gains in IQ and adaptive behaviours (Dawson et al., 2010). Further studies (Eapen et al., 2013; Fulton et al., 2014; Vivanti et al., 2014) have investigated the efficacy of delivery of the ESDM in-group settings.

It is pertinent to note that in comparison to other NDBIs, the ESDM is the most thoroughly researched model, and the only model empirically validated for children under the age of three (Dawson et al., 2010). The ESDM is also one of the few comprehensive NDBIs for children with ASD (Schreibman et al., 2015). Of equal importance, it is one of the few models that has been evaluated when delivered by parents as well as therapists, across a range of settings and varying levels of intensity (Eapen et al., 2013; Fulton et al., 2014; Vivanti et al., 2016), further highlighting its potentiality for use within mainstream educational contexts. The following section explores some of the key components of the ESDM and highlights the potentialities of this approach for implementation within the ECEC learning context.

### **2.8.1 Alignment of the ESDM with the Australian Early Years Learning Framework**

The ESDM may be particularly suited to mainstream early educational settings due to its strong alignment with the key principles of early childhood pedagogy, and its inherent focus on engagement and social interactions being naturally facilitated by typically developing peers. The ESDM is

underpinned by play-based learning, the development of secure and reciprocal relationships, the promotion of all forms of communication, and following child interests and choices. These principles are also reflective of the Early Years Learning Framework for Australia (2010). The EYLF, which underpins and guides the pedagogy of Australian early childhood educators, is an appropriate platform in which to embed this model, as it recognizes: the significance of early learning based on the building of strong relationships in a child's development; the importance of an active role for the adult in children's learning through play; a greater focus on all domains of child development; and the importance of engaging, responsive and reciprocal learning relationships with children, with a focus on intentional teaching (EYLF, 2012).

The goals of the EYLF align closely with the goals of the ESDM particularly in terms of: (a) the significance of early learning that occurs through play and strong relationships encompassing all development domains; and (b) the active role of adults and their responsive and reciprocal roles in the child's early learning processes. Educator knowledge and expertise is paramount to the facilitation of high quality education. Indeed, early childhood settings where the staff-child interactions include direct teaching through play and the provision of instructive learning, which guides but does not dominate children's thinking, are those with the most highly qualified and skilled educators (Siraj-Blatchford, 2004). Within this framework, when additional autism specific training, such as the ESDM, is delivered extensively to educators, their existing practice could be enhanced, enabling them to gain the child's attention sufficiently for intensive and highly engaging teaching. This in turn could enable a high-level of participation for these children within their naturalistic programs. Once the child's attention to people is gained, learning about the social world, including play and language can occur more naturally and these particular synapses in the young child's brain can be strengthened. This social platform sets the stage for cognitive development to occur more naturally through play (Dawson, 2016). Of equal importance, it could capitalise on the universal tradition of educating children in group settings where social learning opportunities are provided by peers as well as adults (Capes et al., 2019). While a clinical setting with 1:1 intervention delivered by an adult is the most researched model of delivery in the ESDM, the barriers of high cost and demand on

parents/caregivers associated with this mode of delivery, could lead to investigating other modes of delivery that are more naturalistic and sustainable for young children with ASD and their families.

The following section explores some of the key components of the ESDM and highlights the potential of this approach for implementation within the ECEC learning context.

### **2.8.2 Key Components embedded within the ESDM**

The ESDM is a Naturalistic Developmental Behavioural Intervention, designed specifically for young children with ASD (Whitehouse et al., 2021). It is also a comprehensive evidence-based intervention that has been manualised, incorporating a fidelity measure based on teaching principles informed by expertise from relevant allied health and early childhood education professionals. The fact that this model is embedded in play and daily routines allows it to be flexible and adaptable in its implementation across multiple settings, perhaps making it highly suitable for mainstream early childhood contexts. Major child learning goals include skills that enable social learning and engagement in naturalistic cooperative activities (eg., spontaneous imitation, joint attention, verbal and non-verbal communication) (Vivanti et al., 2021).

A particularly pedagogical strength of the ESDM is the *Curriculum Assessment tool* which incorporates a comprehensive developmental checklist designed to support the assessment of skills across a range of developmental domains (e.g., receptive and expressive communication, imitation, social skills, play skills, fine and gross motor skills, behaviour, joint attention and self-independence skill) (Rogers & Dawson, 2010). While all developmental domains are targeted, particular emphasis is placed on imitation, non-verbal and verbal communication, social skill development, and pretend play (Talbot et al., 2016), making this approach particularly relevant to enhancing social connections between children with ASD and their mainstream peers. The four levels covered in the curriculum checklist (i.e., 18 months [Level 1], 18 and 24 months [Level 2], 24 and 36 months [Level 3], and 36 and 48 months [Level 4]) support users' understanding of a child's individual development as well as developmental progressions more generally. The curriculum checklist, which is used on entry to a program, enables the therapist (or educator) to determine the child's baseline of development so they know exactly where to start their teaching. The individualised nature of this approach along with the

strong emphasis placed on the role of assessment in underpinning differentiated instruction, makes the ESDM well aligned with high quality early education pedagogy as well as practices and priorities of the Australian Early Years Learning Framework (ACECQA, 2009).

A further strength of the ESDM, and indeed its relevance to the ECEC learning context, lies in the clear connections between assessment and planning. The intervention draws on a *Teaching Plan* which is developed from the Curriculum Checklist of learning objectives for each child. The regularity of assessment, with each child being assessed on a quarterly basis, supports educators to respond to each child's learning and developmental progression. From a pedagogical perspective, these teaching objectives are task analysed to guide the adult to carefully scaffold the child's achievement of each objective over the quarterly period. Such an approach aligns with Vygotsky's Zone of Proximal Development (Vygotsky, 1978), where objectives are set just beyond the child's current level of ability and teaching activities and instructional techniques are designed to scaffold child progress from an immature version of a certain behaviour to a more mature version of that behaviour. Scaffolding is a key component of intentional teaching and a pedagogical approach that underpins the practices of many mainstream educators across Australian and international ECEC contexts. Such alignments in focus and structure speak to the potentialities of the ESDM within mainstream services.

Teaching plans within the ESDM are designed to be shared with the child's parents for implementation in everyday routines at home and the objectives are summarised in a parent friendly version to make this more achievable for them to target in the home setting. Given the inherent challenges experienced by parents of children with ASD with respect to poor communication (discussed earlier in this chapter), an approach that prioritises communication and connection with families is not only important for supporting inclusion but reinforces and aligns with current expectations and frameworks of ECEC practice. Such a strategy has the potential to not only benefit and enhance connections between educators and families of children with ASD, but could extend to all families – suggesting the potentialities of the ESDM for high quality practice more broadly.

Collaboration with the child and family is further supported through the systematic measurement of child progress and mastery of skills which occurs at the end of each quarter. Together educators



and parents review the quarterly *Teaching Plan* to establish a set of objectives to proceed into the next quarter. This approach ensures goals are shared between educators and parents supporting contextual connections and consistency in practice. The play-based practices inherent to high quality ECEC provide an ideal platform for children with ASD to practice many of the skills targeted within their plan through engagement in meaningful and developmentally appropriate play activities and routines with typically developing peers. To this end, objectives on the teaching plan could be carefully selected to focus on the development of child independence and participation within the group. The potential benefit of this approach to intervention is that these behaviours might support the child with ASD to transition to other group settings or experiences (Capes et al., 2019).

*Joint Activity Routines* are the framework for all child learning in the ESDM. A joint activity routine is designed to facilitate interactions between adult and child that are face-to-face. They are carried out in four phases: i) a set-up phase, in which the child chooses an activity or routine and the adult observes, comments on and imitates all child actions, allowing the child to lead them into the activity; ii) a theme or teaching phase in which both adult and child participate jointly, sharing turns, smiles, gaze and lead; iii) an elaboration phase where variations are added to the play to expand the child's repertoire of play skills to increase their flexibility and finally iv) a closedown phase that demonstrates a clear ending and facilitates a transition to the next joint activity routine (Rogers & Dawson, 2010). The goal for this framework is to address specific difficulties the child with ASD experiences (i.e., joint engagement; restricted and inflexible play habits). Given the challenges some children with ASD experience with generalisation of skills beyond the training milieu, the more realistic the "training" the greater the likelihood of social impact. It is possible, if not likely, that skill acquisition could be further enhanced when facilitated in a group setting with typically developing peers. Teaching and instruction then becomes facilitated by the adult, rather than exclusively carried out with the adult. This type of repeated engagement with typically developing peers could be more socially rewarding, thereby increasing the likelihood of optimising child motivation in the most natural way.

Children with ASD are less socially motivated and therefore need to be actively supported to engage with the social environment. Furthermore, child motivation is pivotal in improving a wide

range of behaviours in young children with ASD and is also pivotal in determining later adaptive behaviours (Koegel et al., 1999). Giving the child choices and following their lead into an activity, principles emphasised in the ESDM, are strategies utilised for optimising child motivation (Rogers & Dawson, 2010). In addition to these and interspersing maintenance with acquisition skills, mentioned above, other strategies for optimising child motivation include: using good reinforcer management (i.e., reinforcing all child attempts; use of intrinsic reinforcers), use of the Premack principle, choosing activities that interest the child, adding multiple variations to the play routine and closing down the activity before the child becomes bored, tired or the adult cannot embed any further teaching opportunities (Rogers & Dawson, 2010). Children with ASD are typically drawn to objects and unusual details in their physical environments (Rogers & Dawson, 2010). However, intervention approaches such as the ESDM can change this typical pattern of behaviour in these young children through rich and highly affective interactions with others, particularly if delivered in the naturalistic context of the ECEC, where children are likely to attend on multiple days across the week, enabling the intensity required to achieve change in the most naturalistic way (Vivanti et al., 2019).

The success of any intervention or educational initiative depends, in part, on the effectiveness and rigour with which it is delivered. Not surprisingly, research conducted both in Australia and internationally refers to established links between variation in quality practice and variance in child development and achievement (Siraj et al., 2015). A particular strength of the ESDM, therefore is the structural systems embedded within the program that govern fidelity of delivery. The authors of the ESDM have developed an advanced training and certification program for degree-qualified professionals who have experience working in the field of ASD (Rogers & Dawson, 2010). Embedded in the training and certification program is a fidelity of implementation tool, requiring the therapist to demonstrate high levels of fidelity in the implementation of these techniques throughout child therapy sessions (Rogers & Dawson, 2010). The ESDM has an embedded training component that facilitates this high level of fidelity, including 4 days of intensive professional development, followed by a 12 month certification process. Both of these levels of training are facilitated by a Certified ESDM Trainer, who has previously progressed through certification as an ESDM Therapist, followed by a 2-3 year process of becoming certified as the Trainer. Not only does this add another

level of rigour to this model further facilitating the maintenance of quality control, but it also promotes a shared understanding and consistency in approach across a team.

The ECEC context is characterised by a collaborative approach to instruction and involves multiple educators rather than a single instructor (Hadley et al., 2015); a tool that fosters a shared pedagogical lens and supports consistency across educators is therefore particularly advantageous. The fidelity measure has the potential to enrich the existing practice of an ECEC team of educators who inspire, affirm and challenge their practice. This approach enables collaboration among team members enhancing the core component of regular fidelity checks in an ESDM program (Capes et al., 2019). While the strength of the ESDM lies with the comprehensiveness of the training provided to the deliverer of the program, consideration would need to be given to the variance in expertise and baseline knowledge across a non-specialist team of professionals such as educators in mainstream ECEC team.

The effectiveness of intervention hinges on the knowledge and skills of educators. As discussed earlier in this chapter, many early childhood educators feel ill equipped to effectively support children with ASD within inclusive settings. The need for further professional learning opportunities has been well established (NSW Department of Education, 2020). While a comprehensive training program exists to support implementation of the ESDM, this has been designed and delivered to specialist practitioners with particular expertise, expertise and knowledge that may not be common among mainstream early childhood educators. A common characteristic of the Australian early childhood workforce is the inherent variation in qualifications, with the majority of educators holding certificate or diploma qualifications. These qualifications do not address child development to the equivalent depth as degree programs nor do they address, to the same extent, the importance of assessment informed instruction – both key components of the ESDM (Capes et al., 2019). If the ESDM is to be applied within a mainstream context involving the active participation of all educators across the setting, then the existing approach to professional learning is likely to be insufficient. The manualisation of the ESDM however, provides a paradigm that could potentially be adapted to respond to this variance, thereby addressing the gap in knowledge and skills across an ECEC team. This could then ensure all team members, regardless of their qualification status, are adequately

trained and mentored to contribute equally to the application of an evidence-based intervention program within their mainstream setting.

Further research is needed on the specificity and format of professional learning and mentoring that is required across a diverse team of educators to enable the implementation of evidence-based ASD interventions in mainstream ECECs and to ensure its effectiveness in terms of educator and child outcomes. Consideration would need to be given to resource requirements, differentiated learning strategies that respond to variations in educator expertise, ongoing mentoring that could build educator capacity, and frameworks that support and embed reflective practice, continuous evaluation and monitoring to ensure both feasibility and sustainability. A professional learning program that addressed these considerations has the potential to provide widespread inclusion of children with ASD participating fully in mainstream programs alongside their typically developing peers.

### **2.8.3 Intensity of the ESDM**

Based on the assumption that deficits in children with ASD result from a limited number of learning opportunities compared to their typically developing peers (Rogers & Dawson, 2010), intensity of the intervention is paramount (Dawson, 2010). To this end, the ESDM aims to increase the number of learning opportunities to fill in learning gaps that have accumulated over time. It is for this reason skills are targeted within the context of the child's daily routines and play activities that make up the natural structure of the day in an ECEC setting. The intensity of intervention comes from providing learning opportunities as frequently as possible, through the delivery of clear antecedent behaviour consequence chains during joint play activities and routines to optimize teaching opportunities that occur throughout the child's day. If a child is receiving their intervention in an ECEC context, they are likely to have many more natural opportunities across the day and over several days a week for the duration of their enrolment. If these learning opportunities are a balance of acquisition and maintenance skills, the child's confidence can be promoted through the success they experience when maintenance skills are targeted. With a level of confidence, the child is also more likely to embrace the learning of the acquisition skills, when these are targeted simultaneously. This is also one of the ESDM's strategies for optimising child motivation (Rogers & Dawson, 2010).

## 2.9 Evaluations of the ESDM

A large proportion of studies evaluating the ESDM focused on intensive and individualised ESDM delivered in clinics by a Certified ESDM therapist to a child or a parent being coached to deliver the therapy to their own child (Dawson et al., 2012; Estes et al., 2015; Rogers et al., 2012; Vismara et al., 2009; Vismara et al., 2013). Findings from these studies investigating intensive and individualised treatment programs, demonstrated that the ESDM did improve developmental outcomes for children with ASD.

Further studies have evaluated the group delivery of the ESDM in autism specific services (Eapen et al., 2013; Vivanti et al., 2013; Fulton et al., 2014; Vivanti et al., 2014; Vivanti et al., 2016). Eapen et al., (2011; 2013) evaluated the effects of therapist-delivered ESDM in a specialist group setting for 26 participants with a mean age of 49 months and a clinical diagnosis of ASD. All children in the study received 15 – 20 hours per week of group-based ESDM with a 1:4 therapist-child ratio, plus one hour per week of intensive, individualized ESDM, over a period of 11 months. A quasi-experimental single-group pre and post-test design was used to evaluate the effects of this intervention across the entire range of child developmental outcomes. Results demonstrated an increase in children's receptive and expressive language, visual reception, receptive communication and gross motor skills, as well as a significant decrease in autism symptoms (i.e., paying attention to people, using social smiles and eye contact, taking turns and engaging in play).

In 2013 Vivanti et al., used a one group pre and post-test design to evaluate outcomes for 21 children with a clinical diagnosis of ASD (M = 38 months) who received 15 – 25 hours per week of group-based ESDM over 12 months (with a child to therapist ratio of 3:1). Results from this study demonstrated an increase in child cognitive skills but no significant decrease in autism severity.

In 2014, Vivanti et al., used a two-group comparison design to evaluate the effects of group-based therapist delivered ESDM on outcomes for children with a clinical diagnosis of ASD. The study compared the outcomes of 27 children who received 15 – 25 hours of group-based ESDM intervention (with a therapist to child ratio of 1:3) over 12 months in an autism-specific early learning and care centre with a control group of 30 children who received 'treatment as usual in the

community'. Children in the ESDM group achieved significantly higher cognitive ability and receptive language scores than the control group. However there were no significant differences between groups for adaptive behaviour or autism severity scores.

Eapen et al., (2016) investigated predictors of treatment outcomes in a federally funded Autism Specific Early Learning and Care Centre. These measures included: child pre-treatment ASD symptoms; developmental level; adaptive functioning; parental stress and coping levels. This included 49 children with a staff to child ratio of 1:4 who received 15 to 20 hours of group-based ESDM combined with one session of one-on-one ESDM per week delivered by certified ESDM therapists and teachers. Pre and post-assessment measures indicated that less severe ASD symptoms pre-treatment, particularly in the areas of social affect and play skills, were predictive of better treatment outcomes.

Also in 2016 Vivanti et al., investigated child age as a predictor of treatment outcomes when they compared outcomes of 32 children aged 18-48 months with those of 28 children aged 48-62 months. All children attended another federally funded Autism Specific Early Learning and Care Centre with a staff-child ratio of 1:3. In both settings, they received approximately 15 - 20 hours per week of group-based intervention delivered by teachers and therapists. Children from the younger age-group displayed better outcomes on the verbal developmental quotient of the Mullen Scales of Early Learning but not on other outcomes. Both of these studies highlight the need for further investigation into predictors of outcomes, with the aim of matching child profiles to intervention and settings.

Collectively, the results from these studies suggest that ESDM can be an effective intervention when used in a group-based autism specific setting. All four studies demonstrated improvement in overall child cognitive skills as a result of the ESDM intervention. However, while these studies are encouraging, they are not without limitations and all four studies evaluated the delivery of the ESDM in specialist autism specific early learning and care centres with: low child-therapist ratios; no typically developing peers and teams of certified ESDM therapists. These characteristics are not representative of the wider population of ASD interventions.

## **2.10 Chapter Summary**

Evaluations of the ESDM speak to its effectiveness when implemented in Autism Specific Early Learning and Care Centre (ASELCC) group settings (Eapen et al., 2013; Vivanti et al., 2014). The results from these studies are very encouraging in terms of the potential for the ESDM to improve child developmental outcomes in a specialist group setting. However, results from these studies focused on ASELCC settings with intervention delivered by regular staff who had been trained intensively to become certified therapists. Therefore, these results are not necessarily replicable to mainstream early education and care settings. Potential barriers to this replication include: differences in educator to child ratios, funding for intensive training, physical environments, legislation, and curriculum frameworks. Thus, further research is needed to assess the implementation of the ESDM in a mainstream early education and care setting, delivered by regular educators.

Although the results of the studies outlined above suggest that comprehensive interventions can be effectively implemented in mainstream early education and care settings (ECECs), further research that includes a clear measure of fidelity of implementation is required to replicate and strengthen existing findings. It is also important that future research in this area considers the social and economic validity of the intervention, as this is pivotal to the future replication across mainstream ECECs. Given the current ECEC context of stress, anxiety, and even fear that is experienced by educators including children with ASD who also have maladaptive behaviour, it was imperative to investigate the capacity of the ESDM to reduce these behaviours within mainstream settings (Grace et al., 2014) and more importantly, to examine how the ESDM is implemented by non-specialised early educators and the impact of this on educator skills, confidence and understanding. This was the impetus for Study 3 included in chapter 6.

While each of the ESDM studies outlined previously have reported significant developmental gains following the ESDM intervention and significant decreases in autism-specific symptoms, the results of the Eapen et al. 2013 study investigating developmental outcomes, demonstrated that the six children who made the greatest developmental gains, were those who entered the program with the highest level of maladaptive behaviours (Eapen et al., 2013). For this reason, it was imperative to investigate exactly what impact the ESDM approach had on reducing maladaptive behaviour in young

children with ASD attending a community long day care autism specific setting. This study is outlined in the next chapter.

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## **Chapter 3: Reducing maladaptive behaviours in preschool-aged children with autism spectrum disorder using the Early Start Denver Model.**

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Fulton, E., Eapen, V., Crnčec, R., Walter, A., & Rogers, S. (2014). Reducing maladaptive behaviours in preschool-aged children with autism spectrum disorder using the Early Start Denver Model. *Frontiers in Pediatrics*, 2(40), 1-10. <https://doi.org/10.3389/fped.2014.00040>

**Chapter 3** contains the first published paper presented in this thesis representing the first of a sequel of 3 studies completed by the applicant. Its focus was to investigate the impact that the ESDM intervention had on reducing maladaptive behaviour in children with ASD participating in an autism specific early learning and care centre group program.

### **3.1 Abstract**

The presence of maladaptive behaviors in young people with autism spectrum disorder (ASD) can significantly limit engagement in treatment programs, as well as compromise future educational and vocational opportunities. This study aimed to explore whether the Early Start Denver Model (ESDM) treatment approach reduced maladaptive behaviors in preschool-aged children with ASD in a community-based long day care setting. The level of maladaptive behavior of 38 children with ASD was rated using an observation-based measure on three occasions during the intervention: on entry, 12 weeks post-entry, and on exit (post-intervention) over an average treatment duration of 11.8 months. Significant reductions were found in children's maladaptive behaviors over the course of the intervention, with 68% of children showing a treatment response by 12 weeks and 79% on exit. This change was accompanied by improvement in children's overall developmental level as assessed by the Mullen scales of early learning, but not by significant changes on the Vineland Adaptive Behavior Scales-II or Social Communication Questionnaire. Replication with a larger sample, control conditions, and additional measures of maladaptive behavior is necessary in order to determine the specific factors underlying these improvements; however, the findings of the present study suggest that the ESDM program may be effective in improving not only core developmental domains, but also decreasing maladaptive behaviors in preschool-aged children with ASD.

### **3.2 Introduction**

Autism spectrum disorder (ASD) is a life-long neurodevelopmental disorder characterized by impairments in social interaction and communication, and restricted, repetitive patterns of behavior, activities, or interests (American Psychiatric Association [APA], 2013). The prevalence of ASD appears to be rising worldwide (Elsabbagh et al., 2012), with ASD estimated to affect around 1 in every 88 persons (Centers for Disease Control and Prevention, 2013).

Autism spectrum disorder is recognized as a major public health concern because of its early onset, life-long persistence, and high levels of associated impairment (Simonoff et al., 2008). This impairment is attributable not only to the core symptoms of ASD, but also to the range of co-existing

conditions that individuals with ASD often experience, including emotional and behavioral problems, sleep, feeding and eating problems, sensory sensitivities, learning and intellectual disabilities, as well as co-morbid health and mental health diagnoses (Maskey et al., 2012). These co-existing conditions can be of equal or greater concern for parents and teachers of children with ASD than the core features of ASD, and have a significant impact on behavior management, learning acquisition, and the development of social relationships (Pearson et al., 2006).

Problem behaviors (or maladaptive behaviors as they are referred to in this paper), characterized by disruptive, destructive, aggressive, or significantly repetitive behaviors, are prevalent in young children with ASD (Dominick et al., 2007). For example, Dominick and colleagues (2007) found that 32.7% of children with ASD displayed aggressive behaviors including hitting, kicking, biting, and pinching others. More than three-quarters of these children showed aggressive behaviors both at home and outside the home, and aggression was directed toward more than one person in 92% of cases. Self-injurious behavior, including head banging, hitting oneself, and biting oneself, was present in almost one-third of children with ASD (Dominick et al., 2007). Furthermore, 70.9% of children with ASD had experienced a period of severe temper tantrums and, for 60% of these children, tantrums occurred on a daily basis and were a constant (rather than episodic) problem during the period in which they were present (Dominick et al., 2007).

Several authors have noted a strong negative relationship between the ability to communicate and the prevalence of maladaptive behavior in young children with ASD (Vismara & Roger, 2010). Self-injurious behaviors among children with ASD have also been linked to their receptive and/or expressive communication deficits (McClintock et al., 2010). It follows that when treatment programs focus on developing the young child's communication skills to the extent that they can serve as effective replacement behaviors, a reduction in the maladaptive behavior may result (Durand & Carr, 1991).

Maladaptive behaviors are particularly problematic in group settings, such as early intervention services, childcare services, and preschools, as they can be disruptive to the learning program and pose significant challenges to the children with ASD themselves, their peers, and staff. For these

reasons, maladaptive behaviors are amongst the most commonly identified barriers to the inclusion of children with ASD in group settings (Grace et al., 2008).

Further, once maladaptive behaviors become an established part of a child's behavioral repertoire, they are unlikely to decrease and, according to Berg and colleagues (2000), will typically remain or worsen without intervention. If left untreated, these behaviors can significantly reduce a child's social and educational opportunities by limiting their access to available treatments, learning activities, interactions with others, community experiences and in particular their ability to transition to and participate in school programs (Horner et al., 2002). In addition to having a negative impact on children with ASD themselves, a number of studies have shown that parents' level of psychological distress is associated with the severity of their child's maladaptive behaviors as well as their ASD symptoms (Allik et al., 2006; Bromley et al., 2004; Davis & Carter, 2008; Hastings et al., 2005; Konstantareas & Papageorgiou, 2006; Stuart & McGrew, 2009; Tomanik et al., 2004).

Therefore, early interventions for young children with ASD should incorporate the management of maladaptive behaviors (Koegel et al., 1996). Given the relationship between maladaptive behaviors and deficits in communication and social skills, it is important that intervention approaches target these core deficits. Myers and Johnson (2007) argue that the primary goals of intervention for children with ASD should be to maximize the child's functional independence and quality of life by reducing the core symptoms of ASD; facilitate development and learning; promote socialization; reduce maladaptive behaviors; educate and support families. They suggest that, in addition to targeting communication and social skills, contemporary comprehensive intervention approaches for ASD should target a reduction in disruptive or maladaptive behavior by using empirically supported strategies, including functional behavior assessment (FBA). FBA is "the process of determining the intent an inappropriate behavior serves for obtaining a desired outcome and replacing that behavior with a more appropriate one that accomplishes the same goal" (Maag, 2000, p.136).

The general importance of early intervention for ASD is widely recognized, and is supported by studies showing better outcomes with earlier treatment (Makrygianni & Reed, 2010; Perry et al., 2011). Early intervention for ASD, especially that commencing before the age of 3 years, results in significantly improved outcomes relative to intervention commencing later in life (Dawson, 2008;

Dawson et al., 2010; Seida et al., 2009). Early intervention in the first years of life offers the best potential for children as brain plasticity is greatest during this period, enabling the establishment and reorganization of neuronal networks in response to environmental stimulation (Dawson, 2008).

A review of research conducted by Prior and colleagues (2011) to identify the most effective models of early intervention for children with ASD classifies approaches into three main categories.

Each target maladaptive behaviors differently:

- Biologically based interventions, including medication, have been used to treat the co-morbid symptoms of ASD such as anxiety and hyperactive behavior with varying degrees of effectiveness.
- Psychodynamic interventions target the emotional component of behavior only. However, because ASD is considered a neurodevelopmental, rather than emotional, disorder, there is little empirical evidence demonstrating their effectiveness
- Educational interventions including behavioral interventions such as applied behavior analysis (ABA); the Lovaas program; Pivotal Response Training; developmental and relationshipbased interventions including ESDM; communication-focused interventions and sensory–motor interventions tend to have a positive treatment response. Each of these approaches uses different mechanisms to target maladaptive behaviors, and some advocate for the use of FBA as part of this process. These interventions usually approach behavior modification directly, focusing on the behavior itself.

Programs such as the Early Start Denver Model (ESDM) focus on building communication skills, especially by following the child’s lead and increasing the reinforcement value of social interaction, thereby teaching children adaptive ways of getting their needs met (Rogers & Dawson, 2010). Given that the ESDM is designed to enhance the social attention and communicative abilities of young children with ASD, with particular focus on the critical skills of social attention, affect sharing, imitation, and joint attention, it is conceivable that a significant reduction in maladaptive behavior may result.

Several meta-analyses conducted in recent years have tended to conclude that early intensive behavioral intervention (EIBI), generally defined as intervention that is delivered at an intensity of 15–20 h/week, incorporating the principles of ABA, is the treatment of choice for young children with ASD (Vismara & Rogers, 2010; Reichow, 2012). The literature indicates that superior outcomes are associated with entry into EIBI at the earliest possible age (Granpeesheh et al., 2009; Wallace & Rogers, 2010).

The only comprehensive EIBI program available for children aged <30 months that has been empirically evaluated is the ESDM (Dawson et al., 2010). The ESDM is specifically designed for children aged 12–60 months and is a manualized, comprehensive intervention that integrates ABA into a developmental and relationship-based approach (Rogers & Dawson, 2010). The ESDM is an intensive and comprehensive early intervention model that aims to reduce the severity of ASD symptoms and accelerate children’s development in all areas, with particular emphasis in the cognitive, social–emotional, and language domains.

The ESDM draws from teaching practices developed in the original Denver Model such as relationship-based aspects of the therapist’s work with the child, using play as a foundation for learning, and using communication intervention principles from the field of communication science (Rogers & Dawson, 2010). Positive behavior approaches focus on replacement of unwanted behaviors with more conventional behaviors and FBA is used when behaviors are more challenging.

The first and only randomized controlled trial of the ESDM demonstrated that, compared with children receiving community intervention, children receiving the ESDM showed significant gains in visual processing and improvements in language abilities, with subsequent gains in IQ and adaptive behaviors (Dawson et al., 2010). In that study, children received 20 h/week of one-to-one ESDM intervention in a University clinic setting. There was also a separate parent training module. Two further studies (Eapen et al., 2013; Vivanti et al., 2013) have investigated the efficacy of delivery of the ESDM in group settings. Both studies reported significant developmental gains following the intervention and Eapen and colleagues (2013) also found a significant decrease in autism-specific symptoms.

While Dawson and colleagues (2010) and Eapen and colleagues (2013) investigated the impact of the ESDM on children's adaptive behavior, no studies of the ESDM to date have focused on the effect of the ESDM on children's maladaptive behaviors. Given the adverse effect that maladaptive behaviors have on children with ASD, as well as their parents, it is important to investigate the impact of interventions on these behaviors. This was the primary aim of the present study.

### **3.3 Materials and Methods**

The study was approved by the local institutional and University ethics committees and all families recruited to the study provided informed consent to participate.

#### **3.3.1 Study Design and Participants**

A pre-post study of children treated with ESDM was conducted. Note that clinical outcomes, but not ESDM clinician behavioral ratings data, for a portion of the cohort have been described previously in Eapen and colleagues (2013). Participants were 38 children attending an Autism Specific Early Learning and Care Centre (ASELCC) in metropolitan Sydney, Australia. The center is one of the six ASEL-CCs established by the Australian Government within the setting of a long day childcare center for children aged 2–6 years. All children had a DSM-IV-TR diagnosis of Autistic Disorder, made by a community-based physician, with the exception of one child who had a diagnosis of pervasive developmental disorder not otherwise specified. These children would all have met criteria for a DSM-5 diagnosis of ASD. Exclusion criteria included neurological (e.g., uncontrolled epilepsy) disorders, and significant vision, hearing, motor, or physical impairment.

The average age of children at the time of study commencement was 52.2 months (SD 5.4, range: 38.8–63.7 months), and 35 (92%) were male. English was the primary language spoken at home in 82% of families, although 60% of families reported a cultural background other than Australian.

None of the participants were receiving an EIBI outside of the ESDM intervention offered as part of this program. No families withdrew from the study during the course of the intervention;

however, there were instances of missing data due to families not completing measures within the necessary timeframes.

### **3.3.2 Intervention**

The study employed the ESDM curriculum and teaching principles within a group setting. Other than accommodations to allow translation to the group context, which are described in Eapen and colleagues (2013) modifications were made to the ESDM curriculum.

Rogers and Dawson (2010) outline a specific teaching approach in the ESDM that was followed in this study. ESDM teaching principles are embedded in play and in natural daily routines within elaborated joint activity routines that address multiple objectives across multiple developmental domains. The main focus is on teaching imitation; developing awareness of social interactions and reciprocity; teaching the power of communication; teaching more flexible, conventional, and creative play skills; making the social world as understandable as the world of objects. Rogers and Dawson (2010) contend that just as typically developing children spend their waking hours engaged in the social milieu and learning from it, children with ASD need to be drawn into a carefully prepared and planned social milieu that they can understand, predict, and participate in.

Whilst a primary focus on maladaptive behaviours is not central to the ESDM curriculum, the general approach in this model for children whose level of maladaptive behaviour has not improved after 3 weeks of intervention follows the principles of positive behaviour supports (Carr et al., 2002; Duda et al., 2004). This is a method of applying the principles of ABA that focus on the use of reinforcement strategies to teach children adaptive and conventional behaviours for meeting their needs and expressing their feelings, as well as promoting independent functioning (Rogers & Dawson, 2010). There were only two children in the current sample whose behaviour had not improved after 3 weeks of intervention. For these children, FBA was conducted by the Behaviour Analyst on the Intervention team. This process determined the functions of the child's behaviour and the consequence that was reinforcing the behaviour. This is based on the premise that the behaviour is in the child's current repertoire because it leads to a rewarding consequence;



therefore the effects of a range of consequences must be tested to determine how the behaviour is being reinforced or maintained. The FBA also enabled the Behaviour Analyst to identify replacement behaviours that would serve a similar function for the child but were more conventional behaviours for the child to learn. The ESDM then identifies the skills that can be converted into objectives and targeted in the child's individualized program, so that he/she can quickly learn, master, and generalise the new adaptive behaviours to become part of their behavioural repertoire.

During their attendance at the centre, participants received an hour of intensive individualized ESDM therapy each week, in addition to an hour of intensive small group ESDM therapy daily, and ESDM-driven learning experiences throughout the day. Each child also received between 15 and 20 h/week of group ESDM intervention. The one-to-one sessions were conducted by the child's keyworker, who carried a caseload of five-to-six children across the period of the intervention. Each child had an individualized treatment plan that incorporated a range of objectives dependent on the child's level of functioning. These objectives were developed from the child's initial assessment using the ESDM curriculum checklist, which includes a list of skills spanning receptive communication; expressive communication; social skills; joint attention behaviours; fine motor; gross motor; imitation; cognition; play skills; behaviour; and personal independence (eating, dressing, grooming, and chores).

All interventions were delivered by therapists with tertiary-level qualifications who were trained to certification in the ESDM by an accredited trainer. In order to be certified in direct delivery of this model, therapists were required to achieve: (1) a fidelity rate of 80% or more with the ESDM trainer on each of the 13 ESDM teaching principles across multiple children and sessions, and (2) to achieve the same level of concordance on the individualized written treatment plans they had developed and data they collated on each child. That is, 80% or more concordance was required in both the clinical delivery and data recording aspects of the ESDM, including on the ESDM behaviour checklist, which formed a key measure in this study. There were six key workers, each trained in this way, involved in the study. Therapists also continued to receive clinical supervision in their delivery of the ESDM by an Accredited Teacher.

### 3.3.3 Measures

Pre- and post-measures included the (1) ESDM behaviour ratings as well as the (2) Vineland Adaptive Behaviour Scales, second edition (Parent Form) [VABS-II; (Sparrow et al., 2005)]; (3) Social Communication Questionnaire [SCQ; (Rutter et al., 2003)]; and (4) Mullen Scales of Early Learning [MSEL; (Mullen, 1995)]. The ESDM behaviour rating was also completed 12 weeks after entry to the program.

The rating of children's maladaptive behaviour was completed during the child's individual 1h ESDM session using the ESDM Behaviour Coding system. The coding system allows therapists to quantify the child's behaviour for each 15-min period, as well as for the hourly session as a whole. The rating for the session as a whole was used in this study. This rating measured the level of maladaptive behaviour that was typically present over the hour rather than the best or worst behaviour observed during the session.

The Behaviour Coding system designed by Rogers and Dawson (2010) for measurement of maladaptive behaviours is described below:

1. **Severe problem behaviours** including aggression, self-injurious behavior, frequent and intense tantrums;
2. **Mild problem behaviours** including non-compliance, some tantrums, but able to participate to some extent;
3. **Some problem behaviours** including fussy, whining, some non-compliance, but able to participate in most of the activity;
4. **No problem behaviour** but difficulty staying on task;
5. **Compliant** on task, working at ability level;
6. **Above average** performance for that child; pleasant, excited about the activity.

Rating of behaviour codes was completed by each child's keyworker who conducted their individual ESDM therapy and was responsible for collecting their data within the group program also. These data were then discussed and peer reviewed in daily Key Worker meetings.

Discrepancies were discussed with the ESDM trainer. Senior ESDM trainers working in the UC

Davis MIND Institute were available to discuss significant discrepancies; however this was not required for any behavioural ratings. All child data, including the behaviour codes, were reviewed on a quarterly basis by the ESDM trainer, including through the use of videos of therapy sessions or live viewing (from the observation room) of therapy sessions to ensure ongoing fidelity.

A pre-intervention behavior score was coded on entry to the program (in the therapy session following the initial assessment), a second behavior score was coded after the first 12 weeks of intervention, and a post-intervention behavior score was coded before the child exited the program.

Parents of participating children completed two measures. The VABS-II (Sparrow et al., 2005) assesses parents' perceptions of their child's everyday adaptive functioning in the domains of Communication (including expressive and receptive language), Daily Living Skills, Socialization, and Motor Skills. For each domain, including an overall Adaptive Behavior Composite, a norm-referenced standardized score with a mean of 100 and SD of 15 is calculated. V -scale scores with a mean of 15 and a SD of 3 and age-equivalent scores are calculated for each sub-domain, including Internalizing Behavior, Externalizing Behavior, and the Maladaptive Behavior Index. The VABS-II has well-established strong psychometric properties (Sparrow et al., 2005). The SCQ (Rutter et al., 2003) is a 40-item measure of autism-specific symptoms where scores of 15 or more indicate probable ASD. The SCQ has robust psychometric properties (Chandler et al., 2007; Skuse et al., 2005; Snow & Lecavalier, 2008). These measures were administered at two time points (on entry to and exit from the program). Parents also completed a demographic questionnaire at the start of the study.

In addition, children were assessed at entry to and exit from the program using the MSEL (Mullen, 1995), a widely used, standardized measure of early development for children aged from birth to 68 months, yielding standardized T Scores and age-equivalent scores on the following subscales: Visual Reception, Fine Motor, Receptive Language, Expressive Language, and Gross Motor. The Gross Motor subscale was not administered in this study. Given the majority of children in the current sample did not receive MSEL subscale raw scores that were

high enough for calculation of a meaningful T score (i.e., they were performing at a level <0.1 percentile), standardized developmental quotients (DQs) were calculated for each subscale of the MSEL by dividing each child's age-equivalent score by their chronological age at the time of testing and multiplying by 100, as is common practice. In this regard, a child who was aged 48 months, but who had an age-equivalent score of 24 months, would receive a DQ of  $(24/48) \times 100 = 50$ . An overall DQ was also calculated for each child by taking the average of the child's DQs for the four completed subscales in order to provide an estimate of overall intellectual ability. Note that the sum of the T scores for these four subscales (i.e., Visual Reception, Fine Motor, Receptive Language, and Expressive Language) is used to calculate the Early Learning Composite Score of the MSEL. It should also be noted that the DQs calculated in this study are not equivalent to T scores or the Early Learning Composite Score of the MSEL, but represent an attempt by the study team to standardize scores for the purpose of making comparisons over time.

### **3.3.4 Statistical Analysis**

Paired samples *t*-tests were conducted to compare children's scores pre- and post-intervention on the aggregate measures of clinicianESDM child behaviour ratings; Vineland Adaptive Behaviour Composite score; Vineland Maladaptive Behaviour Index Score; SCQ total score; and overall MSEL DQ. Cohen's *d* effect sizes were also reported. It is widely accepted that Cohen's *d* values of 0.2–0.49 denote small-sized effects; 0.5–0.79 denote medium-sized effects; and >0.8 denote large effect sizes. To explore change, pre- and post-intervention in the subscales of measures used, a series of repeated measures MANOVA analyses were conducted using the Pillai's Trace criterion. The aggregate scores noted above were not included in these MANOVA analyses as these scores were not independent of the subscale scores. Partial eta values were reported as a measure of effect size for MANOVA analyses. Correlations were also computed to investigate relationships between children's behaviour and baseline demographic and clinical variables. Analyses were conducted using SPSS statistical software. Alpha was set at 0.05 for the majority comparisons, following recommendations by Saville (1990) who argues for this per-comparison

level rather than a family wise approach when conducting research in novel areas. An exception to this was in the instance where multivariate effects detected in the MANOVA analyses were further explored using paired samples t -tests. In those cases, a Bonferroni correction was applied.

### 3.4 Results

The average time between pre- and post-intervention assessment was 11.8 months (SD 5.8). As shown in Table 3.1, a significant reduction in clinician-rated ESDM behavior rating was found,  $t(37) = -16.6, p < 0.001$ . The size of this effect was Cohen's  $d = -3.7$ , which is large. There was also a significant increase to children's overall MSEL DQ,  $t(17) = -5.0, p < 0.001, d = -0.41$ , which approaches a medium-sized effect. There was, however, no significant change in children's VABS-II Adaptive Behavior Composite, VABS-II Maladaptive Behavior Index, or SCQ total scores.

To explore changes in core subscales of the VABS-II, a repeated measures MANOVA was performed with VABS-II standard domain scores as the dependent variables (Communication; Socialization; Daily Living Skills; and Motor Skills). The within-subjects independent variable was time, with two levels (pre-intervention and post-intervention). There was no significant multivariate effect of time  $F(1, 11) = 0.18, p < 0.05$  or VABS-II subscale scores  $F(3, 9) = 2.8, p > 0.05$ , nor a domain scores by time interaction. With respect to the VABS-II Maladaptive Behavior subscales, a repeated measures MANOVA was performed with Internalizing Behavior and Externalizing Behavior as the dependent variables and time as the within-subjects independent variable. The multivariate effect of time  $F(1, 13) = 0.67, p < 0.001$  and the time by VABS-II Maladaptive Behavior subscale score interaction  $F(1, 13) = 0.18, p > 0.05$  were not statistically significant. However, the multivariate effect for subscale scores was significant  $F(1, 13) = 23.1, p < 0.001, \eta^2 = 0.64$ . When explored further using paired sample t-tests with an adjusted alpha rate of  $0.05/2 = 0.025$  neither of the Internalizing or Externalizing scores changed significantly over time, however effect sizes were nontrivial (see Table 3.1). In the case of the MSEL, a repeated measures MANOVA was performed with Visual Reception DQ, Fine Motor DQ, Receptive Language DQ, and Expressive Language DQ as the dependent variables and time as the within-subjects independent variable. The multivariate

effects of MSEL subscale scores  $F(3, 15) = 6.5$ ,  $p = 0.005$ ,  $\eta^2 = 0.57$  and time  $F(1, 17) = 24.69$ ,  $p < 0.001$ ,  $\eta^2 = 0.59$  were significant; however, the subscale scores by time interaction were not. When explored further using paired sample t-tests with an adjusted alpha rate of  $0.05/4 = 0.013$ , the Visual Reception DQ, Receptive Language DQ, and Expressive Language DQ all showed significant improvement from pre- to post-intervention with effect sizes approaching medium size (see Table 3.1).

To further explore the speed with which improvement in the level of maladaptive behaviours occurred, *post hoc* analyses were conducted using ESDM clinician-rated behaviour checklist data obtained at entry, 12 weeks post-entry, and exit from the ESDM program. It emerged that, at entry to the program, only one of the 38 children had a behaviour score of 5 or 6 (indicating compliant or above average behaviour). This number increased to 26 of 38 children (68%) after 12 weeks of intervention, and to 30 of 38 children (79%) by the end of the intervention.

A related analysis involved examining the number of participants whose scores improved by three points or more on the six-point scale (taken to denote a conservative estimate of meaningful change) at the different time points. One participant had an entry score that would preclude improvement by three points; hence subsequent analyses were conducted on the remaining 37 children. After 12 weeks of intervention, 25/37 children (68%) had improved by three or more points (rapid responder sub-group), whereas 32% of children had not responded in this way (non-responder sub-group). By program exit, the non-responder group had dropped to 24% of the sample.

**Table 3.1***Correlations between clinician-rated behaviour scores and baseline clinical variables*

	Pre-intervention		Post-intervention		<i>t</i> <sup>a</sup>	df	<i>p</i>	Cohen's <i>d</i> <sup>h</sup>
	Mean	SD	Mean	SD				
<b>ESDM behaviour rating</b>	1.8	1.0	5.1	0.8	-16.6	37	<0.001**	-3.67
<b>VINELAND ADAPTIVE BEHAVIOUR SCALES-II STANDARD DOMAIN SCORES</b>								
<b>Communication<sup>b</sup></b>	62.4	15.2	64.8	19.7				-0.14
<b>Socialisation<sup>b</sup></b>	66.8	14.2	63.7	13.6				0.22
<b>Daily Living Skills<sup>b</sup></b>	62.1	14.7	62.2	16.6				-0.01
<b>Motor Skills<sup>b</sup></b>	69.4	20.7	65.3	23.2				0.19
<b>Adaptive Behaviour Composite<sup>b</sup></b>	62.2	14.8	62.5	14.7	-0.2	12	0.84	-0.02
<b>VINELAND ADAPTIVE BEHAVIOUR SCALES-II MALADAPTIVE BEHAVIOUR</b>								
<b>Internalising Behaviour<sup>c</sup></b>	19.4	1.8	18.9	4.0	0.5	13	0.60	0.17
<b>Externalising Behaviour<sup>c</sup></b>	16.0	2.2	15.1	3.0	1.0	13	0.34	0.35
<b>Maladaptive Behaviour Index<sup>c</sup></b>	18.8	1.4	18.8	1.8	0.0	13	1.0	0.00
<b>SCQ total score<sup>d</sup></b>	18.3	6.3	17.0	7.3	1.0	13	0.34	0.19
<b>MULLEN SCALES OF EARLY LEARNING</b>								
<b>Visual Reception DQ<sup>e</sup></b>	37.2	19.9	48.3	27.3	-2.7	19	0.013 <sup>g,*</sup>	-0.47
<b>Fine Motor DQ<sup>e</sup></b>	46.3	24.3	50.6	21.2	-1.4	21	0.17 <sup>g</sup>	-0.19
<b>Receptive Language DQ<sup>e</sup></b>	30.4	22.3	39.7	24.4	-3.5	17	0.003 <sup>g,**</sup>	-0.40
<b>Expressive language DQ<sup>e</sup></b>	33.4	18.4	40.7	20.0	-4.5	20	<0.001 <sup>g,**</sup>	-0.38
<b>Overall MSEL DQ<sup>f</sup></b>	37.9	19.8	46.5	22.2	-5.0	17	<0.001 <sup>g,**</sup>	-0.41

\* $p < 0.05$ , \*\* $p < 0.01$ , SCQ, Social Communication Questionnaire.

For the SCQ total score, lower scores are indicative of fewer ASD symptoms. Similarly, for VABS-II Maladaptive Behavior subscales (Internalizing Behavior, Externalizing Behavior, and Maladaptive Behavior Index), lower scores denote fewer symptoms. For all other measures, higher scores are indicative of better functioning.

<sup>a</sup>Paired samples t-tests were conducted a priori for aggregate scores of ESDM behavior rating, VABS-II Adaptive Behavior Composite, VABS-II Maladaptive Behavior Index, SCQ total and overall MSEL DQ. In other instances, paired samples t-tests were conducted only following significant results in multivariate repeated measures MANOVA analyses.

<sup>b</sup>Standard score (mean: 100, SD: 15). C

<sup>c</sup>V-scale score (mean: 15, SD: 3).

<sup>d</sup>Range = 0–40. Scores of 15 or more denote probable ASD.

<sup>e</sup>DQ (developmental quotient) = (age-equivalent score/chronological age)  $\times$  100.

<sup>f</sup>Overall MSEL DQ = (Visual Reception DQ + Fine Motor DQ + Receptive Language DQ + Expressive Language DQ)/4.

<sup>g</sup>Bonferroni adjusted  $\alpha = 0.013$ .

<sup>h</sup>Following the recommendations of Dunlap et al. (45), Cohen's *d* scores were calculated using the pooled standard deviation score uncorrected for the correlation between pre-post scores.

A series of independent samples t-tests were conducted to examine whether the rapid responder sub-group differed from the 12-week non-responder sub-group according to baseline variables. Given the relatively small sample size in these analyses, MANOVAs were not performed, and Cohen's d effect sizes were also inspected for cases where the effect size was of medium size or larger (Cohen's  $d > 0.50$ ). Analysis revealed that the SCQ score for the rapid responder sub-group (mean = 16.1) was lower than that of the non-responder sub-group (mean = 21.5) at a level that approached significance  $t(27) = 1.86, p = 0.07, \text{Cohen's } d = 0.77$ , that is, the rapid responder group tended to have lower baseline ASD symptoms than the non-responder group. Other areas where the difference between rapid responder and non-responder groups was above Cohen's  $d = 0.5$  at baseline were VABS-II Communication, Daily Living Skills, and Motor Skills Standard Scores. In all instances, the rapid responder group performed better than the non-responder group at baseline.

Correlations between baseline clinical variables and pre- and post-intervention behaviour ratings as well as change in behaviour ratings are presented in Table 3.2. As shown in Table 3.2 clinician-rated behaviour at entry was not significantly related to any baseline clinical variables, including DQs, autism severity, or adaptive behaviour (all  $ps > 0.05$ ). Clinician-rated behaviour at exit was shown to be significantly and positively correlated with Fine Motor, Receptive Language, Expressive Language, and overall DQs at entry ( $r = 0.46\text{--}0.55, ps < 0.05$ ).

Clinician-rated behaviour at exit was also positively correlated with baseline daily living skills ( $r = 0.42, p < 0.05$ ), that is, the better a child's daily living skills at entry, the better their clinician-rated behaviour at exit. Finally, clinician-rated behaviour at exit was found to be positively correlated with baseline externalizing behaviour, as measured by standardized VABS-II scores ( $r = 0.37, p < 0.05$ ), suggesting that the more problematic a child's externalizing behaviour at entry, the better their clinician-rated behaviour at exit.

Change in clinician-rated behaviour was not found to be significantly associated with any baseline variables (all  $ps > 0.05$ ).



**Table 3.2***Correlations between clinician-rated behaviour scores and baseline clinical variables*

	<b>Entry Behaviour</b>	<b>Exit Behaviour</b>	<b>Change in Behaviour</b>
Entry behaviour rating	-	-	-
Exit behaviour rating	0.14	-	-
Change in behaviour rating	-0.72**	0.59**	-
VABS-II Communication	0.22	0.26	-0.04
VABS-II Socialisation	0.22	0.14	-0.12
VABS-II Daily Living Skills	0.25	0.42*	-0.02
VABS-II Motor Skills	0.12	0.36	0.10
VABS-II ABC	-0.23	0.31	-0.02
VABS-II Internalising	-0.17	-0.09	0.08
VABS-II Externalising	-0.05	0.37*	0.28
VABS-II Maladaptive	-0.13	0.02	0.10
SCQ total	0.08	-0.20	-0.20
SCQ Communication	0.16	-0.18	-0.26
SCQ Restricted Social Interaction	-0.13	-0.24	-0.06
SCQ Repetitive Behaviour	0.13	-0.09	-0.17
VRDQ	0.07	0.37	0.18
FMDQ	0.17	0.55**	0.21
RLDQ	0.26	0.48*	0.10
ELDQ	0.32	0.46*	0.02
Overall DQ	0.23	0.53**	0.16

*Note.* \* $p < 0.05$ , \*\* $p < 0.01$ , VABS-II, Vineland Adaptive Behaviour Scales-II; ABC, Adaptive

Behaviour Composite; SCQ, Social Communication Questionnaire; VRDQ, Visual Reception

DQ Score; FMDQ, Fine Motor DQ Score; RLDQ, Receptive Language DQ Score; ELDQ,

Expressive Language DQ Score.

### 3.5 Discussion

Children with ASD frequently engage in maladaptive behaviours such as aggression, self-injurious behaviour, and stereotyped behaviours (Dominick et al., 2007). These behaviours are problematic in group settings, as they disrupt the learning program and place children at increased risk for social exclusion, making it very difficult for them to transition to and access mainstream education settings (Horner et al., 2002). These behaviours also correlate positively with levels of stress in caregivers (Hastings et al., 2007).

While the genesis of these maladaptive behaviours is thought principally to reside in communication and social skills difficulties, there is some uncertainty in the literature as to whether maladaptive behaviours are best managed via direct behavioural intervention; via treatments targeted primarily at improving pro-social and communicative skills; or via a combination approach. This study sought to examine the behavioural benefits to maladaptive behaviours of the ESDM, an early intervention focused predominantly on improving communication and pro-social skills, within natural daily play and care routines.

Several key findings were obtained. Principally, the level of maladaptive behaviours in the cohort of children studied, as assessed by clinician rating, reduced substantially following the 11-month ESDM intervention period. Moreover, for 68% of the children studied, substantial positive change was observed within the first 12 weeks of intervention. This group, who we have described as “rapid responders” tended to have less severe ASD symptoms at baseline and had a higher level of communication, daily living, and motor skills at baseline compared with children whose level of maladaptive behaviour did not respond quickly to the ESDM. The behaviour rating obtained at entry was not associated with any of the other baseline variables, which together with the finding that only 1 out of the 38 participants had ratings of good behaviour at baseline, suggests that maladaptive behaviours occurred relatively uniformly within the sample. Across the whole sample, the degree of change in behaviour rating from pre- to post-intervention was not associated with any baseline variables. However, clinician-rated behaviour at exit was shown to be significantly and positively correlated with Fine Motor, Receptive Language, Expressive Language, and overall DQs; daily

living skills; higher level of externalizing behaviour at entry. In general terms, we would contend therefore that while maladaptive behaviours appear to have been ubiquitous in our cohort, children with relatively better adaptive functioning and fewer ASD symptoms at baseline seemed more likely to show rapid and subsequent improvement in their level of maladaptive behaviours. Overall, however, more than three-quarters of participants showed improvements (of three points on the six-point scale) in maladaptive behaviours by the end of the intervention. Given the negative consequences of maladaptive behaviour on children's learning (Pearson et al., 2006), the ESDM's ability to bring about reductions in maladaptive behaviours – early in the intervention for around 3/4 of participants – may have allowed children to access and gain from the intervention program more effectively.

Significant improvements were also found following ESDM intervention in MSEL Visual Reception, Receptive Language, Expressive Language, and overall DQs. This is consistent with previous research (Dawson et al., 2008; Eapen et al., 2013; Vivanti et al., 2013). It is possible that, by promoting child development across domains, particularly receptive and expressive communication, and by using appropriate behaviour management strategies, the ESDM resulted in an increase in conventional behaviours and a reduction of maladaptive behaviours. This is consistent with research showing a strong relationship between communication skills and the presence of maladaptive behaviour in young children with ASD (Vismara & Rogers, 2010), and provides support for the suggestion by Myers and Johnson (2007) that contemporary comprehensive intervention approaches for ASD should target communication and social skills in addition to disruptive or maladaptive behaviour.

Furthermore, a child who is highly motivated is also more likely to learn at a faster rate (Vismara & Rogers, 2010). The ESDM works to increase child motivation by incorporating components such as child choice, turn taking, reinforcing attempts, and interspersing maintenance with acquisition tasks (Rogers & Dawson, 2010). The ESDM therapist is also highly trained in managing child attention; delivering clear antecedent, behaviour, consequence sequences; modulating child arousal; creating interesting routines; building dyadic engagement through joint activity routines; responding with sensitivity to all child communicative attempts. The teaching

principle that targets modulation of child arousal equips ESDM therapists to recognize and respond immediately to changes in child arousal levels and modulate these in the moment, potentially preventing maladaptive behaviours from developing in the first place.

Despite improvements in clinician-rated behaviour and developmental skills, maladaptive behaviour ratings on the VABS-II did not show improvement from pre- to post-intervention. It is interesting to observe that the externalizing behaviour score on the VABS-II did show the largest Cohen's  $d$  effect size change of any VABS-II score ( $d = 0.35$ ), but this was not statistically significant. One possible explanation for this finding is offered by Weiss and colleagues (2010), who question the validity of the Maladaptive Behaviour domain of the VABS-II in assessing levels of maladaptive behaviour among children with ASD. It is also important to note that normative data on the VABS are only available for much older children than those in the current sample, and is not available for those with ASD. It is also possible that, while children's behavior during ESDM therapy sessions improved, this improvement did not generalize to the home environment and therefore no changes were found in parent-reported maladaptive behavior. Mastering the teaching principles of the ESDM equips adults to engage, modulate, and motivate the child into an optimal state for learning, hence promoting pro-social behavior. It is possible that the optimal behavior elicited during ESDM sessions was not replicated in other settings as parents or other caregivers were not similarly equipped with the skill set to elicit these pro-social behaviors. This suggestion highlights the potential importance of training parents and other professionals, such as those in school settings, in the ESDM model in order to provide the child adequate opportunities to generalize their newly acquired skills, and ideally of future research to explore the relative outcome for children in groups where parents had, or had not received intervention. We note that there was no specific parent training component to the ESDM intervention applied in this study; however, optional parent education evenings were offered at the center. Similarly, no significant improvements were found in the VABS-II standard domain scores or on the SCQ. This could again be attributable to these measures being parent reports, and skills not generalizing to the home setting; however, the lack of change observed in the current study on the SCQ is inconsistent with findings of significant improvement on this measure by Eapen and colleagues (2013).

Findings of reduced clinician-rated maladaptive behavior and accelerated developmental rates in the present study are promising; however, due to the design of the current study, it is not possible to make conclusions about the mechanisms behind these improvements. That is, it is not possible to determine whether the reduction in maladaptive behavior observed in the present study was a consequence of the ESDM's focus on social attention, affect sharing, imitation, and joint attention, or whether it was due to the use of behavioral techniques that are not specific to the ESDM, such as FBA and positive behavior supports, which have previously been shown to be effective in managing behavior within the framework of multiple treatment approaches. While ABA principles, FBA, and positive behavior supports are integral components of the ESDM, it is important to note that their specific implementation was only required for 2 of the 38 children in the present study whose behavior had not significantly improved after 3 weeks of intervention. It is therefore unlikely that the improvements in maladaptive behavior observed in the present study were directly and solely attributable to these behavioral strategies. Nonetheless, it is necessary to replicate the present study using a larger cohort and control conditions (both a different treatment condition and a non-treatment condition) in order to establish whether the reductions in maladaptive behavior occurring during ESDM intervention are significantly different to reductions that may occur in the context of a different treatment program or by maturation alone.

Regardless of the exact mechanisms behind the improvements in maladaptive behavior in the present study, our findings suggest that the ESDM program may be an effective tool in improving not only core developmental domains, but also decreasing maladaptive behaviors in preschool-aged children. This finding is important, given previous research demonstrating the negative impact of maladaptive behaviors and developmental delays on the child's learning acquisition and the development of social relationships (Pearson et al., 2006). The relatively quick reduction in maladaptive behaviors observed in the present study (68% of children showed a significant decrease in maladaptive behavior by 12 weeks) may allow children to more effectively participate in and benefit from learning opportunities, including the intervention itself, and may be a key factor in the developmental gains observed in the present study and previous research (Dawson et al., 2010; Eapen et al., 2013; Vivanti et al., 2013). It is hypothesized that these developmental

gains, particularly in the areas of receptive and expressive communication, may then provide children with adaptive means of getting their needs met, thereby further reducing maladaptive behaviors.

### **3.5.1 Limitations**

This pilot study was limited by the use of a clinician-rated behavior score as the main dependent variable, particularly given that there were no blind raters on any measures. The fact that significant improvements were found in this rating over the course of the intervention, despite no change in VABS-II Internalizing, Externalizing, or Overall Maladaptive Behavior, raises questions over the reliability and validity of the ESDM clinician-rated behavior score. However, as noted previously, the validity of the VABS-II in assessing levels of maladaptive behavior among children with ASD has been questioned (Weiss et al., 2010). Furthermore, the achievement of inter-rater reliability is fundamental to becoming certified as an ESDM therapist, with a requirement of initial and ongoing consistency of ratings with peers and the ESDM trainer. The fact that 32% of children did not show a change of three or more points in clinician-rated behavior over the first 12 weeks of the intervention is also an argument against rater bias.

A further limitation of the present study was the lack of a control group, which makes it difficult to determine whether the observed behavioral and developmental improvements were the effect of maturation or the intervention. Literature suggests, however, that maladaptive behaviors, once they become part of a child's behavioral repertoire, will typically remain or worsen without intervention (Berg et al., 2000). Moreover, the size of the improvement in maladaptive behaviors observed was large  $d = 3.67$ , which suggests that maturation alone is unlikely to be the causative factor. Similarly, the common course among children with severe ASD presentations without intervention is for IQ to remain the same or regress (Begovac et al., 2009). The children in the current study had relatively severe presentations, including MSEL DQs  $<47$  and VABS-II adaptive behavior scores within the range of 62–70 at baseline. Therefore, it appears that the behavioral and developmental improvements observed from pre- to post-intervention in this study are unlikely to arise as a result of maturation. The uncontrolled design of the present study also means that it is not

possible to determine whether the observed reductions in maladaptive behavior were the result of ESDM-specific principles or to behavioral techniques that are not specific to the ESDM. Therefore, replication of the present study using a larger cohort and control conditions is necessary. Follow-up studies are also required to determine whether the behavioral and developmental improvements observed in the present study are maintained, which has the potential to foster ongoing educational opportunities and improve quality of life for children with ASD and their families.

Since maladaptive and challenging behaviors often pose a barrier to inclusion and community participation with significant consequences on social and educational opportunities, harm or injury to self or others, and family distress, it is critical to address these behaviors in the comprehensive management of children with ASD. The findings of the present study are promising, suggesting that the ESDM delivered in a community setting with relatively minimal one-to-one intensive therapy has the potential to reduce children's maladaptive behaviors which, in turn, may increase their capacity to participate in intervention and educational programs and make gains in other developmental domains.

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**Chapter 4: ‘One of the Kids’ Parent perceptions of the developmental advantages arising from inclusion in mainstream early childhood education services.**

Article published in *Australasian Journal of Early Childhood*

Blackmore, R., Aylward, E., & Grace, R. (2016). ‘One of the Kids’: Parent Perceptions of the Developmental Advantages Arising from Inclusion in Mainstream early Childhood Education Services. *Australasian Journal of Early Childhood*, 41(2), 13-17.  
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**Chapter 4 contains the second published paper presented in this thesis.** The need to embed and consider parent voice as part of the intervention process and to ascertain whether or not intervention was even applicable to a mainstream ECEC setting formed the impetus for this study.

## **4.1 Abstract**

This research explored the perspectives of parents who have enrolled their child with a developmental disability in a mainstream early childhood education service. It asked questions about their experience of engagement with the service, and the extent to which they felt participation in this service was beneficial for their child. Fifteen families whose children had been attending a mainstream service for at least six months were recruited to the study and participated in qualitative interviews. There were three key findings from this study: parents are primarily motivated to enrol their children in mainstream early childhood services because they seek social interactions for their children with typically developing peers; despite increasing support at the policy level for inclusive early childhood education, families encountered many challenges in securing a place for their child at a centre that was willing and able to meet their child's needs; and parents felt that their child's development was supported by attendance at a mainstream centre, particularly in relation to communication and behaviour.

## **4.2 Background and Introduction**

Developmental disorder requiring intervention and support beyond that expected for the child's age, has a prevalence of 3.4 per cent in Australian children aged zero to four years (ABS, 2009). It is widely accepted that early detection of developmental difficulties is crucial to achieving optimal outcomes by improving the developmental trajectories of these children (Corsello, 2005; Dawson et al., 2010; Fernell et al., 2013; Oberklaid & Drever, 2011).

The term 'early intervention' is often used to describe the therapeutic services provided by allied health professionals or other specialised programs and assessment services. Bruder (2010) includes both therapeutic and preschool special education services in his definition. Dunst (2000) expands the concept of early intervention further by including informal social support networks, arguing that social support is associated with positive family functioning and a sense of wellbeing, which is important to improved child and family outcomes. Guralnick (2011) describes the complex reciprocal relationships that operate as families and children engage with each other, with the wider

community and with the service system. He argues for recognising the wide range of influences in a child's life that have an intervention effect, from specific programs through to family factors and community-level influences. This paper adopts Guralnick's broad definition and examines mainstream early childhood education (ECE) services (e.g. preschool and long day care programs) as a form of early intervention for young children with disabilities.

In 2011 the peak age of early childhood education and care (ECEC) attendance in Australia was at four years, when 87 per cent of children were in some form of ECEC, including 82 per cent in formal ECEC (Baxter & Hand, 2015). Australian Government policy supports the inclusion of children with disabilities in mainstream early childhood services, and subsidy schemes to support these policies are in place (Australian Government Department of Education and Training, 2006). Compared to children without disability, participation rates of children with disability had a lower representation in childcare services (3 per cent) than their representation in the community (6.6 per cent) (Australian Government Productivity Commission, 2014).

A significant body of research literature suggests that high-quality ECE services may have a positive impact on the development of all children in relation to cognition, communication, motor and social skills (Kim, 2003; Lazzari & Vandebroek, 2012). Children with developmental difficulties, such as autism, have been found to benefit from the opportunities ECE services provide for observational learning and behaviour modelling of their typically developing peers (Rogers & Dawson, 2010; Taylor & DeQuinzio, 2012). The benefits of engagement with ECE services can extend beyond child outcomes to the family. Vandell (2004) suggests that engagement with ECE services may support families to link in with other services and develop confidence in negotiating the service system. Schertz and colleagues (2011) argue that ECE participation can increase parent wellbeing as well as their knowledge of their child's disability and improve the quality of parent-child interactions.

There is a body of qualitative research that explores parent perspectives on the benefits of inclusion in mainstream ECE services for children with disabilities. This literature suggests that parents, most often mothers, believe that an inclusive setting will benefit their child by: improving their independence; providing opportunities to learn by observing typically developing peers; building

their self-esteem; improving their functional day-to-day living skills; providing opportunities to participate in creative and interesting activities; and improving community understanding and acceptance of children with disabilities (Garrick-Duhaney & Salend, 2000; Rafferty et al., 2001). Parents also raise the possibility of social exclusion (i.e. peer rejection) as a risk associated with mainstream ECE attendance, leading to a negative impact on their child's sense of emotional wellbeing (Hewitt-Taylor, 2008).

In an Australian study, Grace and colleagues (2008) found that one of the most significant barriers for families was finding a mainstream ECE service that was welcoming and willing to enrol their child. Significant parent advocacy and persistence was often required to secure a place at a centre, and to ensure ongoing and meaningful communication between parents and staff. Parents were often willing to tolerate poor inclusive practices and less than optimal communication and support mechanisms rather than jeopardise their child's enrolment. Of course, many parents had very positive experiences as well, with staff training and centre leadership key to the success or otherwise of their experience.

This paper contributes to the existing body of research exploring parent perspectives on the inclusion of children with developmental disorders in mainstream ECE services. The research was a collaborative project between a community paediatrician and a children's service organisation and gave particular focus to questions that helped to inform health professionals in their referral discussions with families.

## **4.3 Methodology**

An interpretive phenomenological approach formed the basis of this work. This approach supports the exploration of human experiences and the way people give meaning to their situations (Benner, 1994; van Manen, 2007).

### **4.3.1 Participants**



Families were recruited from five mainstream ECE services in south-west Sydney. To be eligible for participation in the project, families needed to have a child attending the ECE service with a diagnosed developmental disorder, and the child needed to have been attending the service for more than six months. A total of 15 families were recruited, with a total of 21 eligible target children—five of the families had more than one child with a disability.

For all but one family in which both the father and mother participated in the interview, the mother was the sole interview participant. Some of the characteristics of the participant group are summarised in Table 4.1.

**Table 4.1**

*Participant Characteristics*

	<b>Characteristic</b>	<b>Number (<i>n</i>)</b>
<b>Culture</b>	Anglo-Australian	<i>n</i> = 11
	Spanish	<i>n</i> = 1
	Italian	<i>n</i> = 1
	Lebanese	<i>n</i> = 1
	Greek	<i>n</i> = 1
<b>Area type</b>	Rural	<i>n</i> = 5
	Outer metropolitan	<i>n</i> = 5
	Metropolitan	<i>n</i> = 5
<b>Child diagnoses</b>	Asperger's	<i>n</i> = 3
	Autism Spectrum Disorder	<i>n</i> = 3
	Global Developmental Delay + Autism	<i>n</i> = 12
	Down Syndrome	<i>n</i> = 1
	Language/Communication Disorder	<i>n</i> = 2

### 4.3.2 Procedure

Ethics approval was obtained from the Ethics and Research Governance Office for South Western Sydney Local Health District.

All directors from the five targeted ECE centres agreed to identify and make an initial approach to eligible research participants. The researcher then contacted the families and invited them

to participate in a one-off, face-to-face semi-structured interview. All families who were approached agreed to participate.

Interviews lasted approximately one hour, were audio-recorded and transcribed verbatim. To ensure data reliability, transcripts were sent back to participants to check for accuracy. The families did not request any changes. Each interviewee was asked the following questions: What motivated you to enrol your child in a mainstream early childhood education service?; Tell me about your involvement with this mainstream early childhood education service; Have you noticed any changes in your child's development over this time? If so, what do you think has prompted the change?; What has participation in this service meant for you as a family? Subsequent prompts to the initial questions encouraged parents to relay as much of their own experiences and reflections as possible. For example: Why did you take that step?; What other factors may have contributed to this outcome?

### **4.3.3 Data Analysis**

The sampling process evolved as the study progressed, so that after seven interviews, researchers paused to analyse the first round of data. Practical saturation of the data was achieved after 15 interviews. In line with the recommendation of Strauss and Corbin (1998), data collection ceased when new cases failed to disclose new features and were largely repetitive of previous interviews.

Two of the researchers initially analysed the data independently, using a classification process to synthesise the main themes. Systematic examination of the text was carried out by identifying and grouping themes and classifying and developing categories. The two researchers then met to discuss the emerging themes and categories, and identify common threads within the experiences of the participants.

## **4.4 Findings and Discussion**

Qualitative analysis identified three main themes within the family interviews, regardless of cultural background or child diagnosis: 1) parents are primarily motivated to enrol their children in mainstream early childhood services because they seek social interactions for their children with

typically developing peers; 2) despite increasing support at the policy level for inclusive early childhood education, families encountered many challenges in securing a place for their child at a centre that was willing and able to meet their child's needs; and 3) parents felt that their child's development was supported by attendance at a mainstream centre, particularly in relation to communication and behaviour. These themes are described below.

#### **4.4.1 'If she had been normal, she would have been OK there': Challenges to engagement**

The participants described multiple unsuccessful attempts at securing a place for their child in an ECE service. Twelve of the 15 parents had previously trialled services that they felt were unable to support the inclusion of their child.

Accounts of the search for an appropriate service drew attention to the important role of parents as advocates for their child within the early childhood service system. Parents described needing to have a clear sense of what would be required to support their child within the service context, and then search for a service that was able to provide this. For example, one parent said that her son had been left to sit under a table all day at a previous preschool, and so she moved him to his current preschool where she felt the staff understood that he needed help to join in.

Parent challenges in finding an ECE service that will accept their child with a disability have been reported in the literature previously (e.g. Grace et al., 2008). It is concerning that, seven years after the publication of the study by Grace and colleagues (2008), this situation remains.

#### **4.4.2 'One of the kids': Parent motivations for seeking out a mainstream ECE service**

For 13 of the 15 families, enrolment of their child in an ECE service was motivated by the belief that their child would benefit from opportunities to socialise and interact with their typically developing peers. The remaining two families were following the advice of friends who also had children with disabilities. Parents described a 'peer magic' effect. They believed that interactions with peers would provide their child with a model of desired age-appropriate behaviours. Parents hoped their child would: 'be one of the kids' (Parent no. 7); 'feel confident and accepted in society' (Parent no. 1); and 'learn how to behave by watching and copying kids with no delays' (Parent no. 7).

#### **4.4.3 ‘He tells me what he wants now’: Parent perceptions of developmental change in their child**

Parents identified improvements in child communication and behaviour as the most significant developmental gains they observed in their child as the result of participation in a mainstream ECE service. There was much less emphasis on improvements in child cognition, motor skills or self-care.

Participants reported improvements in vocalising, babbling, talking and singing, as well as the use of eye contact, gestures and words, and language comprehension. This was reflected in comments such as: ‘He can now answer questions and follow directions’ (Parent no. 9); and ‘He tells me what he wants now and looks straight in my eyes’ (Parent no. 7).

Of all the improvements the participants noted, the child’s development of behaviour regulation had the most significant impact on family life. Fourteen of the 15 parents interviewed said that the greatest improvement in their lives was the reduction in their child’s maladaptive behaviours. To quote one parent:

*Her behaviour was so hard at one stage to control, it was very hard for me even to do anything with her or go out anywhere. Now I can take her everywhere ... that’s the biggest improvement for our family (Parent no. 15).*

When participants talked about their child’s developmental gains in relation to behaviour, their responses focused on their child’s ability to cooperate and adapt, to be happier, calmer and more confident. They found relief in the reduced levels of child frustration brought about by increased levels of expressive language. For example: ‘His behaviour has improved because he can tell me what he wants now’ (Parent no. 6).

Maladaptive behaviours have social consequences that are destructive to children’s learning and development (Rogers & Dawson, 2010). It is often very important to families for these behaviours to be replaced over time with more conventional behaviours that are socially acceptable and understandable to others. Promoting a child’s receptive and expressive communication skills, particularly the communicative functions of joint attention, social interaction and turn taking is often a means of preventing and replacing maladaptive behaviours. Increased communicative functions can

provide a child with a mechanism for expressing their needs or frustrations in a verbal form rather than in behaviour that is considered maladaptive, such as temper tantrums (Rogers & Dawson, 2010).

#### **4.4.4 ‘They knew he needed extra help ... he always got that there’: The importance of service quality to improved outcomes**

The parents in this study were very aware of service quality factors such as staff ratios, appropriately qualified staff and service staff committed to inclusive practices. While all of the participating families expressed satisfaction with their current ECE service, the majority had previously tried other services only to remove their child because they were not satisfied with service quality. High ECE service quality was the principle reason that parents gave to explain improvement in their child’s development.

The participants described searching for an inclusive educational program provided by qualified, skilled and experienced educators who could scaffold the peer interactions and learning of their children. They preferred a physical environment that promoted structure and routines with a wide variety of play materials and choice. The parents were looking for support and scaffolding for their child rather than one-on-one care for their child or support worker time. They wanted their child to be ‘one of the kids’, so that they could learn from their typically developing peers.

They also equated quality with the level of support for families in the form of suggested learning activities that could be followed up at home. Parents valued staff who had suggestions on how to: communicate with their child; manage their child’s behaviour; teach their child self-care routines; and deepen their own understanding of child development. Participants were also highly appreciative of the level of emotional support they received from staff (‘she held my hand’ [Parent no. 2]) as well as the referrals to other agencies. Early childhood educators also played an important role in helping parents understand the level of support their child would need as they transitioned to primary school.

Over recent years there has been considerable research focus on the issue of quality in early childhood settings, with a growing awareness that service quality is fundamental to positive outcomes for children, particularly for those children who are vulnerable. One of the key findings from these

studies is the importance of the leadership team within ECE services in establishing and supporting best practice (Saffigna, Church & Tayler, 2011). Implicit in these findings are the underlying messages from neuroscience that favourable learning outcomes happen in secure learning environments organised in such a way as to promote small group interactions—where adults form warm interactive relationships with children and view educational and social development as complementary (Siraj-Blatchford & Manni, 2006).

## **4.5 Conclusion**

This paper explored parental perceptions of the inclusion process and the extent to which it provided a beneficial form of early intervention for their children. Participants wanted their child to benefit from interactions with typically developing peers. They perceived improvements in the areas of communication and behaviour as the main developmental gains, and peer factors and service quality elements as the salient reasons for these changes. Results of this study suggest that, although many participants had difficulty finding the right setting for their child, they did believe mainstream ECE services could be considered a beneficial form of early intervention for children with developmental disorders.

The small participant numbers limited this study. It is important that future research explores the differences between families who belong to different socioeconomic and cultural groups. This research also points to the need for further research examining the barriers to inclusive practice for service professionals, as clearly these barriers persist for some. Another avenue for follow-up is the extent to which parent and professional definitions of service quality and best practice align. The message from this paper is that early intervention professionals recommending ECE to families of children with disabilities should be aware that this is not always straightforward. Securing a position in a high-quality centre can require considerable advocacy and persistence on the part of a parent. It is important that quality inclusive centres and early intervention professionals form partnerships to smooth family engagement with ECE services.

If the parent voice of early intervention believe mainstream ECE services could be considered a beneficial form of early intervention for children with developmental disorders, then it was important

to examining the barriers and enablers to inclusive practice for Educators in mainstream ECECs. This was the impetus for the next study covered in Chapter 6.

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**Chapter 5: The methodology and development of a targeted professional development program for educators to facilitate the application of the ESDM in mainstream ECEC settings.**

**Chapter 5** provides a detailed overview of the methodology for developing, implementing and evaluating the professional learning program, reported in Publication 3 (Chapter 6). This chapter was not prepared for publication.

## **5.1 Background**

Previous studies contained in this thesis have highlighted: (a) the significant impact of the Early Start Denver Model (ESDM) on reducing maladaptive behaviour in young children with ASD (published in Fulton et al., 2014); (b) priorities identified by parents of children with ASD, which have indicated a strong desire for their child to be educated alongside typically developing peers in mainstream services within their local communities (Blackmore et al., 2016); and (c) the level of maladaptive behaviour that co-existed for many of these children, combined with a gap in specialist skills and training across the ECEC sector, preventing inclusion from being achieved effectively and consistently (Blackmore et al., 2016).

The goal of the final study was to examine the capacity for early childhood educators to include children with ASD in mainstream ECEC settings, and to identify barriers to their inclusion, the supports needed to facilitate inclusion, and the specialist skills required for educators to engage and teach children with ASD. To address the gap in specialist skills, the intervention effect of a professional development program, based on the ESDM teaching principles, was investigated. It was believed that such a targeted program could assist in removing critical barriers to successful inclusion through the upskilling and empowerment of educators. As the focus was staff outcomes, only data relating to educator perception of the value of a professional development program, in removing the critical barriers to successful inclusion in ECECs, are included for analysis.

The final study, which is reported in Chapter 8, examines this targeted intervention for training, supporting, and mentoring early childhood professionals in the implementation of the ESDM in a mainstream service. The targeted nature of the training and support was enabled by identifying and addressing educator needs for capacity building in terms of understanding, knowledge, skills and strategies that would instil confidence and competence, when working with children with ASD.

## **5.2 Purpose of the Intervention**

As demonstrated in the previous studies, the ESDM offers a viable approach to reducing maladaptive behaviour in young children with ASD and that maladaptive behaviour is the greatest

impediment to their inclusion in mainstream ECECs. While a number of other interventions, such as ‘JASPER’ (Kasari et al., 2010) and ‘SCERTS’ (Wetherby et al., 2014) have been trialled in mainstream settings, they have not demonstrated efficacy in reducing the barrier of maladaptive behaviour in these settings. For this reason, the ESDM was chosen as an appropriate intervention to apply to the mainstream ECEC. To this end, the purpose of study three was to develop, implement and evaluate a professional learning program that was based on the manualisation of the ESDM and applied to mainstream ECECs.

### **5.3 Research Questions**

While the collection of child development and behaviour data was a natural requirement of embedding the ESDM into mainstream ECECs, the focus of this final study was on educator outcomes. For this reason, the following questions guided this investigation:

1. What is the current capacity for early childhood educators to include children with ASD in their mainstream ECEC settings?
2. What are the barriers to the inclusion of children with ASD in mainstream settings as perceived by these educators?
3. What are the supports and specialist skills needed by educators to facilitate inclusion?
4. What is the feasibility and potential impact of enhancing the existing quality of practice in these services by applying a targeted professional learning and mentoring program?

### **5.4 Overall Research Design**

An interpretive phenomenological approach was used in this study. This approach was chosen because it added depth to the exploration of educator experiences and the way in which they gave meaning to their current situations (Van Manen, 2007). Ethics approval for the study protocol was obtained from the University of Wollongong Human Ethics Committee (2017/147). All participants provided informed written consent for their involvement in the research.

The social validity of the professional learning program (PLP) for educators was evaluated through a systematic collection of the perceptions of participants gathered through in-depth interviews

and questionnaires, prior to commencement, throughout the PLP and following completion. The assessment of social validity could be useful in terms of identifying factors that may facilitate or hinder implementation of evidence-based intervention programs, such as the ESDM, in mainstream ECEC settings. Identifying such factors could be important, given that there has been reported difficulty associated with translating evidence-based interventions into practice in community-based settings (Drahota et al., 2012). The perceptions of early childhood professionals regarding the benefits of and barriers to implementing an intervention may help to bridge this gap (Stahmer et al., 2017).

## **5.5 Participants**

Three community based, not-for-profit mainstream ECECs who had received 'Exceeding' in all areas of their Assessment and Rating Scale (ACEQA 2009) were invited to participate. High quality services were purposely selected for this study to ensure a quality foundation at each site before applying an additional layer of teaching in the form of ESDM. All three services had 25 licenced places for children and each service had a history of including children with ASD aged 3 – 5 years. Table 5.1 provides an overview of key centre demographics.

All three services were situated in South-West Sydney, two were in low socioeconomic areas with a SEIFA ranking of 1, while the third service was situated in a more affluent area in the same region with a SEIFA rating of 10. This was selected to ensure a more diverse mix of child and family populations. Each of the three services had five children with ASD enrolled. These children were aged between 3 – 5 years ( $M = 52$  months), attended for 15 hours per week and had a diagnosis of ASD and a moderate to severe developmental delay. Thirteen of the fifteen children also presented with maladaptive behaviour on enrolment to these programs. The remaining children in each setting were typically developing. There were no exclusion criteria. Thirteen of the child participants were male and two were female. All staff across the three settings were invited to participate in the study. Of the 53 participants, the majority were female ( $n = 52$ ).

## 5.6 Research Phases

**Table 5.1**

*Centre Demographics*

Centre	Director Qualification	Educator Qualification	Licensed places	Child:staff ratio	SEIFA ranking	ACEQA ranking
Centre A	Masters Special Ed & BEd <sup>a</sup>	Diplomas <sup>b</sup> / CCEs <sup>c</sup>	25	3:1	1	Exceeding all areas
Centre B	BEd <sup>a</sup>	Diplomas <sup>b</sup> / CCEs <sup>c</sup>	25	5:1	1	Exceeding all areas
Centre C	Masters Special Ed & BEd <sup>a</sup>	Bachelor ECT / Diplomas	25	8/10:1	10	Exceeding all areas

<sup>a</sup>Bachelor of Early Childhood is a 4 year University Degree course

<sup>b</sup>Diploma in Early Childhood is a 2 year TAFE College course

<sup>c</sup>Certificate in Children's Services is a 6 month TAFE College course

The research was conducted in four phases: Phase 1 included an investigation of the current enablers and barriers to the inclusion of children with ASD in mainstream ECECs; Phase 2 focused on the development of the Professional Learning Program (PLP) which was informed by Phase 1 results and the ESDM evidence-based program of practice; Phase 3 was the implementation of the PLP Intervention; and Phase 4 involved the educator evaluation of the PLP intervention. Each of these are described in detail below.

### 5.6.1 Phase 1 – Investigation of the current enablers and barriers to inclusion

Individual semi-structured interviews were conducted with all participants one month prior to commencement of the PLP to investigate educators' perceptions of the current enablers and barriers to inclusion of children with ASD in their services. The interviews were conducted face-to-face, lasted for 1 hour and were recorded for later transcription. Questions were posed that targeted the following areas: educator knowledge and understanding, skills and capacity, attitudes towards and barriers to inclusion, professional learning goals, educator competence and confidence in working with children

with ASD (see Table 5.2). Responses to questions were used to inform Phase 2 - the design of the PLP.

**Table 5.2**

*Phase 1 Interview Questions*

<b>1</b>	How do you perceive your own capacity, knowledge and understanding when including children with ASD in your setting?
<b>2</b>	Do you feel that you have the necessary specialist skill set to work with children with ASD?
<b>3</b>	Have you identified common goals, related to this work, for your team's professional development?
<b>4</b>	Do you think it might be possible to apply an evidence-based model of intervention effectively and efficiently in your setting and do you think this might help your team?
<b>5</b>	What do you need in order for this to be achieved in your service?
<b>6</b>	Have you identified the barriers that might impede this application?
<b>7</b>	Would a targeted professional development program facilitate this process for you and your team?
<b>8</b>	Will it result in removing significant barriers to inclusion for children with ASD and lead to higher levels of participation?
<b>9</b>	Do you think this may lead to increased confidence in your team and perhaps greater job satisfaction?
<b>10</b>	What would you like your service to look like at the end of this process?

### **5.6.1.1 Coding and Analysis of Phase 1 Data**

A systematic team approach was adopted in analysing the qualitative data (pre-study semi-structured interviews and post-study questionnaires) (Giorgi, 2012). In the first instance, the first author used multiple readings in order to become familiar with the data, followed by an inductive process whereby initial codes were ascribed semantically. To ensure reliability in coding, initial codes and raw data were provided to the second author for checking, with instances of disagreement resolved through ongoing discussion and re-reading of raw data. Agreed codes were then categorised to generate higher order themes. A final reiterative process involving both authors was conducted to ensure these accurately reflected the raw data.

Key themes that emerged from this iterative process and subsequently guided the development of the Professional Learning Program in Phase 2 were: i) inadequate capacity across educators to engage children with ASD in learning - *“we don’t know how to engage our child with ASD in learning activity, he keeps running away from us”*; ii) specialist skills required by educators to achieve this - *“we didn’t learn anything about working with children with ASD in our training to be an educator”*; iii) supports needed by educators to enable the development of specialist skills - *“we need much more than a workshop to achieve this...we need you to mentor us in the moment...that’s’ how we will learn”* and; iv) service barriers to enabling each of these steps - *“we don’t know how to assess a child’s development...we haven’t done that before and we don’t even know much about ASD or how it effects the child’s development”*. Key themes were drawn upon to inform the design of the PLP in Phase 2.

### **5.6.2 Phase 2 – Development of the targeted Professional Learning Program**

The focus of Phase 2 was program development related to Tier 1 of the PLP – ‘One of the Kids’, developed for the purposes of study three. Tier 2 of the PLP – the ‘ESDM Advanced Workshop’ was an existing PLP, developed by the authors of the ESDM (Rogers & Dawson, 2010) and implemented in Phase 3 for degree qualified educators only. Prior to the current study all ESDM intervention studies (Eapen et al., 2013; Fulton (Aylward) et al., 2014; Vivanti et al., 2013; Vivanti et al., 2014) included the Advanced level of the ESDM as a training requirement prior to delivery. Enrolment in this level of training (described in Chapter 3) requires participants to hold a degree-qualification and therefore negates the involvement of many ECEC staff given the high proportion of educators holding vocational qualifications (i.e., Diploma or Certificate trained). The need to expand the professional training linked to the ESDM program to ensure a more inclusive approach was the rationale for the development of an additional Professional Learning Program (PLP) Tier 1 design. This program sat alongside the Advanced level of the ESDM Training and was sensitive to the differential knowledge base of participants. PLP Tier 1 was based on the curriculum and teaching principles of the advanced training but mapped to the Early Years Learning Framework, which was



the current National Australian Curriculum for Early Childhood Education. Tier 1 of PLP is detailed in the subsections below.

### **5.6.2.1 Tier one**

Tier one was informed by Phase 1 data and developed for Diploma and CCC trained staff in the form of a three day PLP titled: ‘One of the Kids’ – Strategies for Understanding, Engaging and Guiding the Behaviour of Young Children with ASD in Mainstream Settings. While this three day workshop was based entirely on the ESDM Curriculum and Teaching Principles, it was simplified to make it readily understandable to a wider audience with a range of qualifications, as opposed to the clinical language used in the Tier 2 Advanced ESDM Workshop. It focussed on the educator’s role in terms of delivering the ESDM Teaching Principles through the natural play activities and daily routines of the ECEC daily program. This contrasted with Tier 2 which involved assessing the child with ASD and developing their individual goals, task analysis and data collection processes. The terminology embedded in Tier one was also simplified to facilitate clarity of understanding. For example, all of the ESDM teaching principles in Tier two PLP were re-named in a way that made them more readily relatable to educators, such as of Managing Child Attention in Tier two, was replaced with Stepping into the Spotlight in Tier one; Dyadic Engagement in Tier two was replaced with It takes Two to Tango in Tier one; Optimising Child Motivation in Tier two, was replaced with Find the Smile in Tier one; Adult Sensitivity and Responsivity in Tier two, was replaced with Listen to the Talking Body in Tier one.

Tier 1 PLP included multiple video examples as well as theoretical components of the ESDM. It also included a live session each day, where participants worked with a child with ASD, to embed their learning and follow this up with reflective analysis. A series of guided practice modules were developed, by the candidate, for the trainees to reach fidelity to the model (see Appendix C). Random video sampling and self-monitoring checklists were important components of these modules to facilitate critical reflection on a regular basis. A complete overview of this training program is included in Volume 2 (Appendix C).

**Table 5.3***Key Components of PLP required by Tier 1 and Tier 2 Educators*

<b>Required Activity</b>	<b>Tier 1 Educators</b>	<b>Tier 2 Educators</b>
ESDM Advanced Workshop	NO	YES
One of the Kids Workshop	YES	NO
Self-Monitoring Checklist	YES	YES
Fidelity Measure	YES	YES
Certification Process	NO	YES
Accreditation Process	YES	NO
Guided Practice	YES	YES
Booster Coaching Sessions	YES	YES
Monthly Forums	YES	YES
Curriculum Checklist	NO	YES
Data Collection Procedures	YES	YES

### **5.6.3 Phase 3 – Implementation of the Professional Learning Program (PLP)**

Both tiers of the PLP intervention, PLP Tier 1: *One of the Kids* and PLP Tier 2: the *ESDM Advanced* workshop packages were delivered across the three participating services. Five of the educators completed the *ESDM Advanced* four day workshop (PLP Tier 2) and the remaining 48 educators completed the three day *One of the Kids* workshop (PLP Tier 1). Tier 2 was incorporated for the degree qualified educators in the form of the *ESDM Advanced* Workshop which was an existing Professional Learning Program developed by Rogers and Dawson (2010), followed by the *ESDM* Certification process (see Appendix D). This *ESDM Advanced* followed the manualised training process of a 10-hour Introductory Workshop, followed by a 3-day Advanced Workshop, delivered by a Certified *ESDM* Therapist and candidate (see Appendix E). These workshops were then followed by the manualised *ESDM* Certification Process which requires trainees to complete a 12-month process of achieving fidelity to the model and is also supervised and supported by the Certified *ESDM* Trainer (see Appendix D for details of fidelity process and requirements). The degree-qualified educators who completed the Advanced workshop, then proceeded through a 12 month Certification process (see Appendix D), with fortnightly booster coaching sessions, delivered by the candidate, to scaffold their progress towards fidelity in the model. Please refer to Table 5.3.

The Tier 1 *One of the Kids* workshop (developed in Phase 2 and detailed in Appendix F) involved all remaining educators at each setting. Following completion of the workshop educators proceeded through an accreditation process, developed by the candidate (see Appendix C) and weekly guided practice, delivered by three Certified Therapist Mentors. Understanding and developing the skills to implement the ESDM Teaching Principles (see sub-section **5.6.3.4 below**) was a completely new way of working for all participating educators. In response to this, a follow-up guided practice was developed and extended to both Tier 1 and Tier 2 educators. A Self-Monitoring Checklist was also developed for the purposes of this study to support educator reflection and engagement (see Table 5.4). This was used by both Tier 1 and Tier 2 educators. Table 5.3 outlines the varied requirements and supports provided to educators across the two tiers. Details of each component are described in the following subsections.

#### **5.6.3.1 Guided Practice**

This component of the PLP was a bespoke, in-residence mentoring program developed by the candidate for the purposes of supporting both tiers of educators. It was delivered on the floor, and was individualised to educator need. A comprehensive approach across both tiers ensured a consistent approach to mentoring and support that was sensitive and responsive to the needs of the educators, at a series of points in time. Three Certified Therapists (trained and certified by the candidate and under the management and mentoring of the candidate), were each responsible for one ECEC service, visiting their nominated service for 3 hours each week to provide in-service mentoring, coaching and fidelity checks. Video samples were taken throughout these guided practice visits to facilitate participant reflective practice. Following the two-hour session on the floor, described above, the mentors met with the whole staff team for a further hour to discuss any challenges they were facing and brainstorm solutions together. The feedback from the staff meetings was brought back to the monthly forums to inform ongoing evaluation. This component of the PLP extended for the duration of the study.

#### **5.6.3.2 Fidelity Rating Scale**

Educator effectiveness and adherence to the delivery of the ESDM intervention, across all participating educators, was evaluated by using the ESDM Fidelity Rating Scale (Rogers & Dawson, 2010). This is a 5-point Likert scale measuring adult fidelity against 13 key therapist behaviours – the ESDM Teaching Principles. Every participant had been trained and mentored to master and generalise these teaching principles across three different children engaged in multiple activities. They could then embed these in their daily program and within the Early Years Learning Framework. Following the formal training and Certification or Accreditation processes, their application of the teaching of these principles was checked weekly by a certified ESDM Therapist. They include:

- i) Management of child attention to activity and then to adult or peer in an alternating fashion;
- ii) Delivering clear antecedent to elicit new behaviours and following up with logical and contingent consequences in all of their teaching episodes;
- iii) Using the instructional techniques of least to most prompting, fading of prompts, shaping new behaviours through repetition, chaining schemas and managing errors in a playful way;
- iv) Modulating their own arousal (emotional state, volume and activity level) to enable modulation of child arousal levels;
- v) Managing unwanted behaviours through determining the function of the child's behaviour, identifying a replacement behaviour that is conventional and teaching this like any other objective in the child's program.
- vi) Dyadic engagement is the lovely co-constructed balance of control, with coordinated sharing of smiles, gaze, turns and materials using lead and follow, then follow and lead.
- vii) Optimising of child motivation, which begins with child choice of materials, interspersing maintenance with acquisition skills, good use of reinforcer strength and premack principle, choosing the activity well and creating lots of opportunities for child learning within and ending or closing the activity before the child loses interest.
- viii) Using positive affect in face, voice and actions throughout all interactions with the child. This should be rich and genuine and matched by the child's. This way the child soon

learns that we are a fun play partner and worth attending to.

- ix) Adult sensitivity and responsivity should permeate all interactions, enabling the adult to acknowledge and respond to all child non-verbal and verbal communicative cues with empathy. It also involves mirroring the child's emotional states to show understanding and empathy and was commonly referred to as *listening to the talking body*.
- x) Setting up opportunities for child to communicate in a variety of ways such as greeting, asking for help, offering help, signalling finished, protesting, labelling, requesting, commenting, affirming and imitating with eye contact.
- xi) Matching adult language to child's language level using the on-up-rule.
- xii) Using the joint activity routine as the framework for all teaching and adding variations to the play to extend our teaching opportunities and teach flexibility across play materials.
- xiii) Transition between activities is carefully constructed also. Closing down and packing away are important elements for the child to learn, that one thing closes down before another opens and the adult aims to sustain motivation with this attentional shift

Every educator had been trained, prior to implementation and then mentored to master and generalise these teaching principles across three different children engaged in multiple activities (see Appendix D). Following the formal training and certification for Tier 2 educators, or training and accreditation processes for the Tier 1 educators, their application of the teaching of these principles was checked weekly by their mentor certified ESDM Therapist. If participants didn't meet fidelity at 80% they were given a more targeted version of the guided practice and booster coaching sessions, which responded to the unique challenges they were facing. They were followed up with further fidelity checks. This additional layer of intervention was further individualised in direct response to issues and challenges that came out of the fidelity checking and weekly staff meeting reviews.

### **5.6.3.3 Self-Monitoring Checklist**

A self-monitoring checklist was developed to support both tiers of educators to critically reflect on their own practice and scaffold their ongoing quality improvement towards fidelity. Each educator was required to reflect on one activity they had facilitated each day with a child with ASD

(see Table 5.4 below). This tool had a three-point Likert scale and the capacity to set goals for the next week. It is a rapid coding system designed to be completed in 10 minutes. The low demands of the checklist was deemed important to ensure high uptake within a time demanding ECEC context.

**Table 5.4**

*Educator Self-Monitoring Checklist*

Educator: \_\_\_\_\_ Date: \_\_\_\_\_ Activity: \_\_\_\_\_

a. The child showed consistent interest in the activity and in me throughout the activity.	1 Not often	2 Sometimes	3 Mostly true
<i>Next time I will:</i>			
b. The child and I had fun. We both smiled frequently and enjoyed ourselves.	1 Not often	2 Sometimes	3 Mostly true
<i>Next time I will:</i>			
c. I followed the child's attention in the activity rather than only trying to direct the child's attention from one thing to another.	1 Not often	2 Sometimes	3 Mostly true
<i>Next time I will:</i>			
d. My turns involved a balance of commenting, imitating, showing and elaborating on the child's activities.	1 Not often	2 Sometimes	3 Mostly true
<i>Next time I will:</i>			
e. I consistently responded to the child's looks, smiles, sounds, and actions by naming things and actions.	1 Not often	2 Sometimes	3 Mostly true
<i>Next time I will:</i>			
f. Our joint activity had all four parts: set up, theme, variation, and closing.	1 Not often	2 Sometimes	3 Mostly true
<i>Next time I will:</i>			
g. When the child's attention shifted, I followed the shift with appropriate language and action.	1 Not often	2 Sometimes	3 Mostly true
<i>Next time I will:</i>			
h. If the child got stuck on an action or toy, I found a way to engage him or her in a new activity.	1 Not often	2 Sometimes	3 Mostly true
<i>Next time I will:</i>			
<b>Weekly reflection journal:</b>			

**5.6.3.4 ESDM Curriculum Checklist Assessment**

While the primary focus of this study was on the educators themselves, it was important to follow the protocol of the ESDM model integral to the fidelity process. To this end each child participant received an ESDM Curriculum Checklist Assessment on entry to each of the mainstream

ECECs (see Appendix G, Dawson et al., 2010). These were delivered by each service's mentoring Certified ESDM Therapist. From this assessment, each child's learning objectives and task analysis were developed by the ESDM Advanced workshop trainees (Dawson et al., 2010). There were ten learning objectives set for each child, and reviewed each quarter by the Tier 2 educator, in collaboration with their mentor (see Appendix H). These were targeted through play, small and large group experiences and daily routines by all participating educators, across the daily program every day. The targeting of these learning objectives was a key component of both tiers of the PLP, and integral to their achievement of fidelity. Unlike specialist ASD settings, each mainstream setting had regular staff to child ratios of 1:4; 1:8 and 1:10. Child data against these objectives were collected by all educators across the day, following their interactions with the child.

#### **5.6.3.5 ESDM Behaviour Checklist.**

Each child's behaviour was coded using the ESDM Behaviour Checklist (Rogers & Dawson, 2010), to monitor child progress towards adaptive behaviour. The Behaviour Coding system is described below:

- i) *Severe problem behaviours* including aggression, self-injurious behaviour, frequent and intense tantrums;
- ii) *Mild problem behaviours* including non-compliance, some tantrums, but able to participate to some extent;
- iii) *Some problem behaviours* including fussy, whining, some non-compliance, but able to participate in most of the activity;
- iv) *No problem behaviour* but difficulty staying on task;
- v) *Compliant* on task, working at ability level;
- vi) *Above average* performance for that child; pleasant, excited about the activity.

#### **5.6.3.6 Timeframe of Events**

In order to analyse the feasibility and effectiveness of applying this model of intervention to mainstream ECECs, the following measures were applied over 18 months. See Figure 5.1 below.

#### **5.6.3.7 Data Collection Procedures**

To analyse the feasibility and effectiveness of applying this model of intervention to mainstream ECECs, the following measures were applied in relation to the implementation of the ESDM Curriculum Checklist:

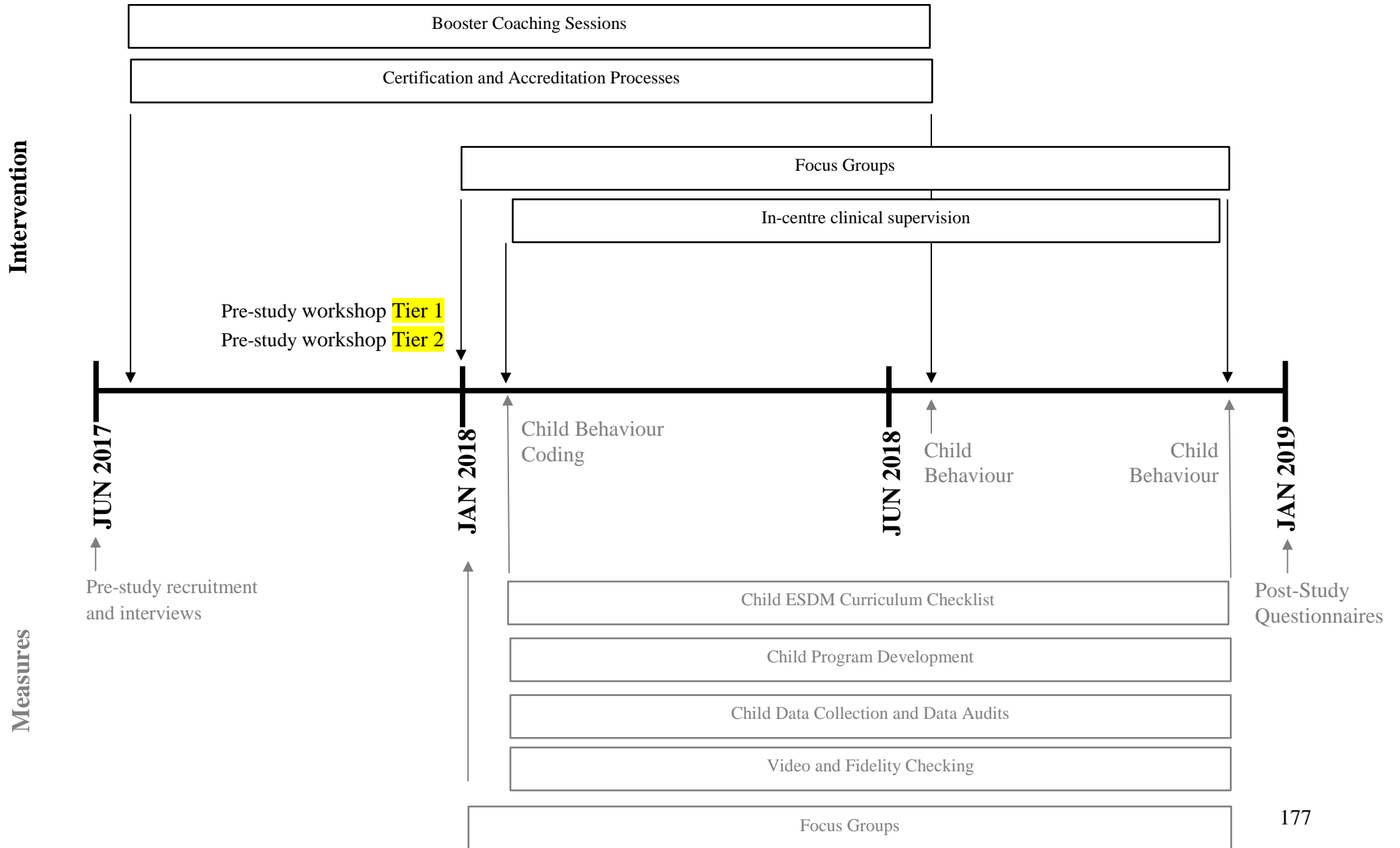
- i) Child data were collected daily to measure child progress towards the achievement of their learning goals which had been derived from the entry assessment, using the ESDM Curriculum Checklist (Dawson et al., 2010). This is an essential component of the intervention model so quarterly data audits were carried out by the Certified ESDM Therapists delivering the Guided practice at each service.
- ii) Child behaviour was coded (using the ESDM Behaviour Rating Scale, Dawson et al., 2010) on entry to the mainstream program and again after 12 weeks and again at 12 months to measure the impact of educator fidelity on reducing maladaptive behaviours in children. These were completed by the tier two certifying educators in each service, who were also responsible for collecting child data within the group program. These data were discussed and reviewed in weekly staff meetings. Discrepancies were discussed with the ESDM Certified Trainer (candidate) at monthly clinical supervision meetings. All child data, including the behaviour codes, were reviewed on a quarterly basis by the ESDM on-site mentor.
- iii) Fidelity Measures (Dawson et al., 2010). The quantitative data collected to evaluate the level of fidelity to the model reached by each Educator was achieved through continuous video sampling against the Fidelity coding templates (Dawson et al., 2010) and self-monitoring checklists (Table 5.4). These were also analysed to measure the impact on their teaching techniques (see Table 5.2). Include the fidelity as a sub heading within the measures in this chapter
- iv) Clinical supervision was also provided to the certified mentoring therapists, by the candidate, each week for 2 hours. This incorporated video analysis, coding reliability and cross checking of child data. This additional measure informed the discussion around the progress, or lack of progress towards fidelity, in each of the Educators. The achievement of fidelity, across the day was challenging to educators.



- v) This could be indicative of the distinct differences in the physical and social environments between a clinical setting and a mainstream preschool, where it was much more difficult for educators to eliminate the competition for the child's attention on them (Vivanti et al., 2017).

**Figure 5.1**

*Timeline of Research Activities for the PhD Research and Broader Study*



## 5.6.4 Phase 4 – Educator evaluation of the Professional Learning Program

### Intervention

Phase 4 represented the evaluative component of the study and was conducted both concurrent to Phase 3, drawing on data from the weekly mentoring sessions and monthly staff forums, and as a follow-up in the form of participant questions following completion of the intervention.

#### 5.6.4.1 Post-Study Questionnaires

Post study questionnaires were implemented at the end of the 18-month intervention and used to assess all participating educators' perceptions of the impact of the professional learning program on their own professional growth and practice. This was a purpose-built questionnaire which was generated by the mentors and the researcher in collaboration with the ECEC Directors at monthly forums. The questionnaires were administered at the completion of the study and included 10 open-ended questions which addressed: educator perceptions of the PLP and sense of value, whether there was a shared understanding of the intervention and its outcomes; challenges they faced along the way, insights and learning; and workforce development (see Table 5.6).

**Table 5.6**

*Post-Study Questionnaire*

1	Is there a shared understanding of the purpose of this model of intervention?
2	Has the intervention been delivered as intended?
3	Were any barriers to delivery experienced in your setting?
4	If so, what were the reasons for these barriers?
5	Were you able to overcome these barriers and if so, did this require additional assistance?
6	Can you identify the key supports that you needed to ensure program success?
7	What issues did you experience in maintaining fidelity across the day and program
8	What do you see as the main impact of this professional development program on your staff?
9	What was the impact of the professional development program on your: i) overall program; ii) the target children; iii) the other children in the service and iv) the families?
10	Do you have any suggestions regarding improvements that could enhance this project for future implementation?

#### **5.6.4.2 Content Analysis**

A systematic team approach was adopted in analysing the qualitative data (pre-study semi-structured interviews and post-study questionnaires) (Giorgi, 2012). It is important to note that this was a collective process. That is all data from both tiers of PLP were collapsed in this phase, to reflect the whole team intervention and teaching approach that was essential to this study. In the first instance, the first author used multiple readings in order to become familiar with the data, followed by an inductive process whereby initial codes were ascribed semantically. To ensure reliability in coding, initial codes and raw data were provided to the second author for checking, with instances of disagreement resolved through ongoing discussion and re-reading of raw data. Agreed codes were then categorised to generate higher order themes. For example, the subthemes of personal benefits, deeper understanding of impact of ASD, preventative practices, helping parents, increased skills in peer mentoring and guided practice, inclusive program, and clinical supervision were all grouped under the higher order theme of “sense of value”. A final reiterative process involving both authors was conducted to ensure these accurately reflected the raw data.

Processes adopted to ensure the trustworthiness in these data included the use of multiple cases/educator perspectives, cross-checking of data and themes with participants as well as cross-checking of themes with the practitioners who delivered the guided practice component of the intervention. This inclusive process of cross-checking of themes enhanced robustness of the data and enabled corroboration of findings. Debrief strategies between the two authors were also used to critically review and challenge assumptions during the analysis and writing stages (Creswell, 2014). Only the data for the post-study questionnaires are included in publication 3 (see Chapter 6).

### **5.7 Chapter Summary**

This chapter outlined the specific methods used in Study 3 in order to generate valid data. This data were used to measure the impact of the Professional Learning Program (PLP) Intervention on mainstream educators and their understanding of the pedagogical considerations for, and inhibitors to implementing such an intervention in an Australian Early Childhood Education and Care context.

Chapter 6 provides a description of the aims, methodology, results, discussion and conclusions from this study and has been published in the *Australasian Journal of Special and Inclusive Education*.

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**Chapter 6: Application of an Evidence-Based Early Intervention  
Model for Children With ASD in Mainstream Early  
Childhood Education and Care Settings via a Targeted  
Professional Development Program**

Article published in *Australasian Journal of Special and Inclusive Education*,

Aylward, E., & Neilsen-Hewett, C. (2021). Application of an Evidence-Based Early Intervention Model for Children With ASD in Mainstream Early Childhood Education and Care Settings via a Targeted Professional Development Program. *Australasian Journal of Special and Inclusive Education*, 45(2), 135-149. <https://doi.org/10.1017/jsi.2021.11>

**Chapter 4 contains the third published paper presented in this thesis.**

## **6.1 Abstract**

Viewing all children as active participants in their own learning is central to inclusion. That children with atypical development experience a level of belonging that enables this in mainstream early childhood education and care (ECEC) settings remains a topic of hot debate and very much an unmet goal across the sector. Children with autism spectrum disorder (ASD), in particular, face significant challenges in ECEC settings, their educators continually seeking solutions for greater support. Given the escalating demand on mainstream ECEC settings to include these children, it was important to identify the specific supports needed by educators to achieve this with confidence and competence. This study investigated the outcomes of applying an evidence-based model of intervention to mainstream services via a targeted professional development program. Results of the study found that the benefits of engagement with mainstream ECEC settings extended beyond child outcomes to educators who were supported to develop the knowledge, understanding, and strategies to engage and teach children with ASD and manage their behaviours.

## **6.2 Introduction and Background**

There is an increasing body of evidence to suggest that outcomes for children with autism spectrum disorder (ASD) can be enhanced through evidence-based early intervention (Roberts & Williams, 2016). Research is also showing that intervention in the first years of life offers the best potential for children with ASD, as the ability of the neural networks in the brain to change through growth and reorganisation is greatest during this period, enabling the establishment and reorganisation of neuronal networks in response to environmental stimulation (Dawson, 2008). Many children are already enrolled in mainstream services prior to diagnosis; by building the capacity of educators, rather than following current trends of relying on additional support personnel without specialist skills, these children could potentially be supported to participate more fully in these programs. Considerable data is emerging regarding the effectiveness of educator capacity building for achieving child-related outcomes. No criteria or guidelines currently exist, however, to assess the capacity of mainstream early childhood education and care (ECEC) settings to deliver ASD early intervention,



and there is limited understanding of staff perspectives, expectations, and experiences in regard to this service delivery model.

According to Bene and colleagues (2014), teachers who are not specifically trained in educating children with ASD often struggle to meet the children's needs and require further professional development in evidence-based instructional practices to ensure that children with ASD are involved and confident learners, with a strong sense of identity and wellbeing (Bene et al., 2014). To achieve this, children with ASD need to be supported by differentiated teaching strategies tailored to meet their individual needs, enabling them to learn and participate to their fullest capability (NSW Department of Education, 2019). This is reliant on educators possessing the necessary skills to engage and facilitate children's learning effectively and to feel confident in doing so. Therefore, these settings need to be well resourced with evidence-based programs and strategies, and professional development, with access to specialists in the field, to enable young lives to realise their full potential (NSW Department of Education, 2019).

### **6.2.1 Early Start Denver Model**

The Early Start Denver Model (ESDM) is a manualised, comprehensive play-based intervention that integrates applied behaviour analysis and pivotal response training with developmental and relationship-based approaches (Rogers & Dawson, 2010). The teaching principles used in this model are informed by expertise from relevant allied health and early childhood education professions. Major child learning goals include skills that enable social learning and engagement in naturalistic social interaction and cooperative activities (e.g., spontaneous imitation, joint engagement, verbal and nonverbal communication; Rogers et al., 2017). The ESDM is a naturalistic model that is not tied to a specific delivery setting. Therefore, it can be delivered by multidisciplinary teams and/or parents in group programs, clinical settings, or in the child's home, potentially rendering it suitable also for mainstream application with regular staff.

#### **6.2.1.1 Using the ESDM to promote inclusion within mainstream settings**

The ESDM is a comprehensive intervention that lends itself well to mainstream ECEC settings because it is underpinned by play-based learning, the development of secure and reciprocal

relationships, the promotion of all forms of communication, and the following of child interests and choices. These principles are reflective of the Australian Early Years Learning Framework (EYLF; DEEWR, 2009), acknowledging that a child's earliest development takes place within the context of secure and reciprocal relationships. These relationships are essential for the child to become an involved and confident learner and effective communicator. However, research has demonstrated that working within this framework is not always as achievable for mainstream ECEC settings when endeavouring to include a child with ASD.

In terms of group delivery of the ESDM, research has only evaluated its impact on children attending autism specific early learning and care centres (ASELCCs) with a teacher-to-child ratio of 1:4 (Eapen et al., 2013; Fulton et al., 2014; Vivanti et al., 2013; Vivanti et al., 2014; Vivanti et al., 2018). It is not known whether ESDM can be effectively implemented by regular educators in mainstream ECEC settings working with a significantly higher staff-to-child ratio of 1:8/1:10. According to Melhuish (2014), the importance of staff ratios needs to be considered within the context of staff qualifications, which is the determinant for measuring ECEC service quality. For this reason, the focus needs to be on building educator skills, knowledge, understanding, and confidence to investigate how their existing quality of practice can be enhanced by intensive and targeted professional development and mentoring. The practices of educators have been linked to the level of their qualifications and to the quality of their ongoing professional development (Siraj et al., 2015). The combination of these two factors may well impact on educator ability to facilitate a high level of participation in a wider range of learning experiences for children with ASD in mainstream ECEC settings.

The authors of the ESDM have developed an advanced training and certification program for degree-qualified professionals who have experience working in the field of ASD (Rogers & Dawson, 2010). However, given the critical role played by the educators who make up a mainstream ECEC team, an additional level of professional development is needed to facilitate implementation of the model and to address a range of educator qualifications. In response, a paraprofessional training and mentoring program was developed by the first author for diploma- and certificate-trained staff in ECEC settings to sit alongside the existing advanced level of training and certification. This

professional development program (PDP) is titled ‘One of the Kids’ and incorporates strategies for understanding, engaging, and guiding the behaviour of young children with ASD in mainstream settings (Blackmore, Aylward, & Grace, 2016). It is based entirely on the ESDM teaching principles and Curriculum Checklist (Rogers & Dawson, 2010) but modified to be more accessible for staff without university qualifications and inclusive of essential elements in the EYLF (DEEWR, 2009) and the regular ECEC environment. The design of the PDP is outlined in Appendix C.

### **6.3 Purpose of the Study**

This is the third in a series of studies that have highlighted (a) the significant impact of the ESDM on reducing maladaptive behaviour in young children with ASD (published in Fulton et al., 2014); (b) priorities identified by parents of children with ASD, which have indicated a strong desire for their child to be educated alongside typically developing peers in mainstream services within their local communities (Blackmore et al., 2016); and (c) the level of maladaptive behaviour that coexisted for many of these children, combined with a gap in specialist skills and training across the ECEC sector, preventing inclusion from being achieved effectively and consistently (Blackmore et al., 2016). The goal of the current study was to examine the capacity for early childhood educators to include children with ASD in mainstream ECEC settings and to identify barriers to their inclusion, the supports needed to facilitate inclusion, and the specialist skills required for educators to engage and teach children with ASD. In order to address the gap in specialist skills, the effect of a PDP, based on the ESDM teaching principles, was investigated. It was predicted that such a targeted program could assist in removing critical barriers to successful inclusion. As the focus was staff outcomes, only data relating to educator perception of the value of a PDP, based on the ESDM teaching principles, in removing the critical barriers to successful inclusion in ECEC settings are included for analysis.

### **6.4 Method**

An interpretative phenomenological approach was used in this study. This approach was chosen because it added depth to the exploration of educator experiences and the way in which they gave meaning to their current situations (van Manen, 2007). Ethics approval for the study protocol

was obtained from the University of Wollongong’s Human Research Ethics Committee (Ethics Approval Number: 2017/147). All participants provided written informed consent for their involvement in the research.

### 6.4.1 Participants and Setting

Educators were recruited from three community-based, not-for-profit mainstream ECEC settings in the south-west Sydney region. There were up to five children with a diagnosis of ASD already enrolled at each service. The children were aged between 3 and 5 years and attended for 15 hours per week. The three centres had each received ratings of ‘exceeding’ in all areas of their assessment and rating scale (Australian Children’s Education and Care Quality Authority [ACECQA], 2012). Each service had 25 licensed places and a history of including children with ASD aged 3–5 years. The selection of services was made in an attempt to capture services that were classified as high quality, with a diverse mix of child and family populations. The quality of the ECEC settings had very recently been assessed through the ACECQA assessment and ratings process where services are given a rating for each of the seven quality areas (ACECQA, 2012). There were no exclusion criteria, and all educators participated willingly. An overview of centre demographics is included in Table 6.1.

**Table 6.1**  
*Centre Demographics*

<b>Centre</b>	<b>Director qualification</b>	<b>Educator qualification</b>	<b>Licensed places</b>	<b>Child–staff ratio</b>	<b>SEIFA ranking</b>	<b>ACECQA ranking</b>
Centre 1	MSpecEd & BECT	Diplomas/CCEs	25	3:1	1	Exceeding all areas
Centre 2	BECT	Diplomas/CCEs	25	5:1	1	Exceeding all areas
Centre 3	MSpecEd & BECT	BECT/Diplomas	25	8/10:1	10	Exceeding all areas

*Note.* MSpecEd = Master of Special Education; BECT = Bachelor of Early Childhood Teaching; CCEs = childcare certificates; SEIFA = *Socio-Economic Indexes for Areas*; ACECQA = Australian Children’s Education and Care Quality Authority.

## **6.4.2 Measures**

Pre-study interviews were conducted with all educators. The same educators completed questionnaires at the end of the study. Fidelity of program implementation was measured weekly as this was an essential part of the mentoring and coaching component.

### **6.4.2.1 Semi-structured interviews**

Individual semi-structured interviews were conducted with all participants prior to commencement of the PDP. Questions targeted the following areas: educator knowledge and understanding; skills and capacity; attitudes towards, and barriers to, inclusion; professional development goals; and educator competence and confidence in working with children with ASD. Responses to questions were used to inform the design of the PDP. The 10 questions that guided the interview are included in Appendix E.

### **6.4.2.2 Post-test questionnaire**

Post-test questionnaires were used to assess educators' perceptions of the impact of the intervention on their own professional growth and practice. This was a purpose-built questionnaire that was generated by the mentor alongside the ECEC directors at monthly forums. The questionnaires were administered at the completion of the study and included 10 open-ended questions, which addressed educator perceptions of the PDP and sense of value, whether there was a shared understanding of the intervention and its outcomes, challenges they faced along the way, insights and learning, and workforce development. The questions are included in Table 5.6.

### **6.4.2.3 Fidelity of implementation and self-monitoring**

Fidelity checking was a key component of the approach to coaching and mentoring. Educator effectiveness and adherence to the delivery of the ESDM intervention was evaluated by using the ESDM Teaching Fidelity Rating System (Rogers & Dawson, 2010) and the Self-Monitoring Checklist (Rogers & Dawson, 2010). These measure adult fidelity against 13 key therapist behaviours — that is, the ESDM teaching principles (e.g., management of child attention, sensitivity and responsivity, managing unwanted behaviour, and dyadic engagement). Meeting fidelity can be demonstrated by achieving a score of 80% or more across all samples being measured. Each educator had been trained

and mentored to master and generalise these teaching principles across three different children engaged in multiple activities. The Self-Monitoring Checklist was used to encourage continuous reflective practice across coaching and mentoring sessions and worked alongside the ESDM fidelity tool to scaffold and monitor the educator's progress towards fidelity in the delivery of the intervention approach.

### **6.4.3 Procedure**

#### **6.4.3.1 Implementation of the PDP**

Following the prestudy interviews, all educators were invited to participate in a targeted PDP 6 months prior to the study commencing. Educators were trained in one of the two levels of PDP, according to their level of qualifications. All degree-qualified educators were trained in the advanced level of ESDM PDP. The remaining educators were trained in a paraprofessional PDP developed by the first author, enabling the implementation of a whole-team approach. The evidence-based intervention applied to each service was the group version of the ESDM (Vivanti et al., 2016), which is a manualised adaptation of the ESDM for group models.

Although the primary focus of this study was the educators themselves, it was important to also follow the protocol of the ESDM model by ensuring each child with ASD received an ESDM Curriculum Checklist assessment (Rogers & Dawson, 2010) prior to the intervention being applied. These were delivered by certified ESDM therapists who were not on staff in any of these settings. From this assessment, each child's learning objectives and task analyses (Rogers & Dawson, 2010) were developed by certifying ESDM therapists, at each service. There were 10 learning objectives set for each child. Objectives were reviewed quarterly. They were targeted through play, small and large group experiences, and daily routines by all educators. The achievement of these objectives was assessed using data collected by certifying educators who were the degree-qualified early childhood teachers and directors in each service. Child data were reported by Fulton and colleagues (2014) and are not reported as part of the current study.

All educators continued to receive weekly guided practice (GP) in both the practical and data components of the intervention throughout the 12-month study. The GP component of the PDP, also

developed by the first author, was included in this paraprofessional level of training to replace the certification component of the advanced level of training. Essentially, the GP is a mentoring model intended to empower professionals by matching them with a mentor already certified in the ESDM but with similar qualifications to those being mentored. These ‘like’ mentors (Heider, 2005) were engaged to coach, model, and guide educators ‘in the moment on the floor’, on a weekly basis.

In order to analyse the feasibility and educator effectiveness of applying this model of intervention to mainstream ECECs, it was necessary to collect quantitative data on every educator to evaluate level of fidelity to the ESDM model both pre- and poststudy. Meeting fidelity required each educator to achieve 80% or higher on all samples coded. Fidelity coding sheets (Rogers & Dawson, 2010) were used for this purpose. Following the formal training and certification or accreditation processes, educators’ application of the ESDM teaching principles was checked weekly by a certified ESDM therapist. If participants did not meet fidelity at 80% agreement, they were given additional guided practice and booster coaching sessions with follow-up fidelity checks. Self-monitoring checklists were also used throughout the study to scaffold the process for each educator reaching fidelity. These were completed via random video sampling and weekly observations, of all participants, and documented by the mentor.

#### **6.4.4 Data Analysis**

##### **6.4.4.1 Data coding and reliability**

A systematic team approach was adopted in analysing the qualitative data (pre-study semistructured interviews and poststudy questionnaires; Giorgi, 2012). In the first instance, the first author used multiple readings to become familiar with the data, followed by an inductive process whereby initial codes were ascribed semantically. To ensure reliability in coding, initial codes and raw data were provided to the second author for checking, with instances of disagreement resolved through ongoing discussion and re-reading of raw data. Agreed codes were then categorised to generate higher order themes. For example, the subthemes of personal benefits, deeper understanding of impact of ASD, preventive practices, helping parents, increased skills in peer mentoring, guided practice, inclusive program, and clinical supervision were all grouped under the higher order theme

of 'sense of value'. A final reiterative process involving both authors was conducted to ensure these accurately reflected the raw data.

Processes adopted to ensure the trustworthiness in these data included the use of multiple cases/educator perspectives, crosschecking of data and themes with participants, as well as crosschecking of themes with the practitioners who delivered the GP component of the intervention. This inclusive process of crosschecking of themes enhanced the robustness of the data and enabled corroboration of findings. Debrief strategies between the two authors were also used to critically review and challenge assumptions during the analysis and writing stages (Creswell, 2014). Only the data for the poststudy questionnaires are included in the current study.

## **6.5 Results**

Prior to the implementation of professional development plus coaching and mentoring model, each of the participating services met with a senior special education consultant to explore the design principles and assist with challenges around inclusion. During the initial forum, participating educators identified a preference for a peer-to-peer mentoring program with the peer being an educator who was a certified ESDM therapist, rather than a certified ESDM therapist from another discipline, as it was perceived that educators would better understand the intricacies of an ECEC program.

At the commencement of the study, the only expectation of the educators was that they focus their ESDM teaching principles (Rogers & Dawson, 2010) on the five children with ASD in each setting. However, several weeks in, at the first monthly clinical supervision forum, there was a consensus reached by the directors of each service that ESDM teaching principles were 'simply best practice', preferring to use them to guide their interactions with all children across their programs. From the educator perspective, 'this created a significant shift in practice towards a higher quality program, with a higher level of involvement and participation from all children across the daily program' (poststudy questionnaires: response from Early Childhood Teacher [ECT] Director, Centre 3, aligning closely with the Department of Education's most recent definition of inclusion where all students, regardless of ability, should not only access but also fully participate alongside their similar-



aged peers, supported by necessary program adjustments and teachers with specialist skills (NSW Department of Education, 2019).

### 6.5.1 Educator Perceptions of the Impact of the PDP

An analysis of the poststudy questionnaires identified five main themes: enhanced outcomes, sense of value, challenges, insights and learning, and workforce development. The subgroups within each main theme are outlined in Table 6.2.

**Table 6.2**

*Educator Perceptions Surrounding the Impact of the Professional Development*

<b>Enhanced outcomes</b>	<b>Sense of value</b>	<b>Challenges</b>	<b>Insights and learnings</b>	<b>Workforce development</b>
Increased confidence	Personal benefits	Data collection	Reflective practice	Application of principles
Increased competence	Deeper understanding of impact of ASD	Physical environment	Quality of practice increased significantly	Peer support
Team work	Preventive practices	Controlling materials	Staff–child interactions now rich and frequent	Child participation
Shared understanding	Helping parents	Sharing attention	Realistic expectations	Manage behaviours
Consistency across the team	Increased skills	Changing habits	Tuning into children’s nonverbal cues	Intuitive responsiveness
Skills for engaging children with ASD	Peer mentoring and guided practice	Unlearning practices	Understanding the functions of behaviour	Work as a team
Children with ASD fully participating	Inclusive program	Time for certification	Child development and impact of ASD	Apply new skills to engage all children

Confidence to prevent/manage behaviours	Clinical supervision	Qualifications	Science of learning — why we do what we do	Respond with confidence to all behaviours
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### **6.5.1.1 Enhanced outcomes: Increased capacity and teamwork**

Participants attributed the positive child outcomes and reduction in maladaptive behaviour to the increased capacity and team work of educators: ‘We gained greater confidence, not just as individuals but as a team and it has brought us all onto the one page now’ (Educator, Centre 2); ‘The professional growth of our team and our increased confidence, understanding and knowledge in really teaching children with ASD was the greatest outcome for me’ (Educator, Centre 2). The PDP, followed by the GP component, facilitated the sharing of goals, information, critical reflection, and continuous improvement of practice: ‘ESDM is fully embedded in our program now for all children and it has strengthened our consistency and team approach’ (ECT Director, Centre 3). In ECEC settings, a team approach that incorporates a shared understanding and leadership can result in educators who are committed to a culture of continuous learning, respect, and support (Hadley et al., 2015). By adopting this approach, educators can inspire, affirm, and challenge the practice of their peers. This can enrich the team by bringing together different perspectives and experiences.

### **6.5.1.2 Enhanced outcomes: Opportunities for peer interaction**

Increased skills and reduction of maladaptive behaviour was also associated with the multiple opportunities children with ASD had to practise and generalise their developing skills with typically developing peers. Prior to the implementation of the PDP, educators were concerned about their own level of interactions with children with ASD and that the children with ASD were not able to engage with typically developing children enough of the time: ‘Before the training and guided practice, we didn’t know how to interact with these kids and we couldn’t interact long enough to even complete an activity or engage them in a group experience’ (Educator, Centre 1). Perhaps the children with ASD had not learned, prior to the PDP, that an adult can be a highly affective play partner who is fun, helpful, and worth attending to.

Educators in the current study spoke of increased capacity and skill as a result of their involvement in the PDP: ‘Children with ASD are participating fully in the program now because our team has developed the skills to engage them and scaffold their interactions with peers’ (ECT Director, Centre 1). A paradigm of inclusion is that all children, regardless of ability, can not only access but also fully participate alongside their similar-aged peers, supported by necessary program adjustments and teachers with specialist skills (NSW Department of Education, 2019). This was achieved once educators had completed the entire scope of the targeted PDP: ‘For the first time, we had confidence to work with these kids in a meaningful way and facilitate peer-to-peer interactions and higher levels of participation across the day’ (Educator, Centre 3). It seems plausible to suggest that this was an outcome of the PDP.

### **6.5.1.3 Educators’ sense of value**

Involvement in the PDP also resulted in enhanced sense of worth and value and a reduction in stress as perceived by the educators:

*Our team was scared of the behaviours that we experienced with our children with ASD, but now we know how to identify the function of child behaviour and replace inappropriate with appropriate behaviours ... this is the best thing that has happened to all of us. (Educator, Centre 3)*

This is a clear demonstration of educators developing a deeper understanding of child development and behaviour through the PDP process. It would be reasonable to suggest that this resulted in an important finding in the current study, which was the significant reduction in stress as a result of participating in the PDP: ‘As the team leader, I value most the reduction of stress and burnout that my staff were experiencing prior to this professional development program’ (ECT Director, Centre 1).

### **6.5.1.4 Challenges faced by educators**

The GP component of the PDP facilitated the abilities of educators to overcome many of the barriers they faced initially. With the regular and ongoing support of their mentor, who could model, guide, and facilitate the brainstorming of solutions, educators developed the skills and confidence to target the individualised objectives with all of their children with ASD: ‘Without the follow-up guided

practice we would have struggled to master and embed the skills of targeting individual child objectives and collating the data. This helped us keep up the momentum of our new learning over time' (ECT Director, Centre 2).

Part of the program requirements was collection of data on each child. This presented a challenge to educator participants: 'Data collection was a challenge initially, until the role could be shared and the data modified to fit the Mainstream ECEC context' (ECT Director, Centre 3). Once all educators were working with an acceptable level of fidelity in the use of the ESDM, the additional load of the data collection could be modified and shared across the team. The GP model also ensured that educators were challenged to develop reflective practices and become more analytical about their own practice, thereby helping educators to achieve greater autonomy and ownership of their work.

Overwhelmingly, the benefits of the program far outweighed any challenges faced:

*The challenges didn't compare to the stress, anxiety and even fear that we were challenged by before this PD program. Our team was scared of the behaviours that we experienced with our children with ASD, but now we know how to prevent/manage and replace them with appropriate behaviours ... this is the best thing that has happened to all of us. (ECT Director, Centre 3)*

#### **6.5.1.5 Insights and significant learning for educators**

Participant responses demonstrated a shared understanding of the purpose of the model and the key characteristics and processes of intervention being applied to their settings. The weekly fidelity checks, which measured the integrity of delivery, validated this outcome by demonstrating that the intervention had been implemented as intended:

*Working through the rigorous process of becoming certified in the ESDM equipped us with the understanding, knowledge, skills and strategies to optimise child motivation enabling us to engage children with ASD long enough to target their objectives through rich and highly affective interactions within activities that lasted for more than 2 minutes. (ECT Director, Centre 3)*

The educators found it very empowering to understand, justify and be able to articulate the evidence and rationale behind their approach to children: ‘Finally, I am applying the science of learning so I know why I do what I do and how it relates to the neurology of the child’s brain and I know how to articulate this to others’ (ECT Director, Centre 3). To this end, the insights and learning that were most significant to the study participants included increased reflective practice combined with a deeper knowledge and understanding of the impact of ASD on the child’s development and behaviour: ‘My thinking is altered, my reflections are different, more useful because I see children’s development and behaviour differently now, with deeper knowledge, understanding and so much more confidence’ (ECT Director, Centre 1). The ESDM Curriculum Checklist (Rogers & Dawson, 2010) gave educators insight and clarity into the range of developmental impacts of ASD on a child’s developing brain. With ongoing peer mentoring and support, there was a considerable shift in staff expectations of children, combined with a deeper understanding of their development: ‘The deep knowledge of child development gained through this process has guided me to be more realistic in my expectations for all children’ (ECT Director, Centre 2).

A particularly encouraging finding from the current study was the impact that the intervention had not only on children with ASD but also on the quality of each service as a whole. Educators participating in this study reported that the PDP and ongoing GP enhanced the delivery of their pedagogical practices: ‘The Guided practice component of this PD program made us more reflective and analytical about our own practice’ (ECT Director, Centre 3). This fostered increased knowledge, understanding, and reflective practice, thereby enabling educators to become more effective in supporting children with ASD: ‘We feel like we really know how to work with these kids now and their parents have confidence in us because we know what we are doing and why we are doing it and it works’ (Educator, Centre 3).

#### **6.5.1.6 Workforce development**

Fidelity checks showed that all participating educators developed a specialist skill set, with percentage of fidelity of the ESDM teaching principles ranging from 80 to 86% with a mean score of 83%, by the end of the study. Each child’s learning objectives were targeted through regular daily

routines and planned individual and group experiences; however, the teaching practices adopted by all staff were different to their previous practice. They were developing a specialist skill set to promote higher levels of participation across the daily program, for all children with ASD. The aim of the PD seemed to have been realised.

The GP component of the PDP supported each service to embed sustainable practices that will continue to contribute to workforce stability over time and reduce the impact of including children with ASD on the staff team:

*As a team, we have learned the direct cause and effect of our own behaviours on the child's. This was scary at first because we could see that we actually triggered that behaviour in that child, but then it empowered us. (ECT Director, Centre 1)*

This is supported by all priority areas of the Early Childhood Education Workforce Strategy (NSW Department of Education, 2018), which includes (a) promoting the critical role of well-trained early childhood educators in a child's educational journey, (b) supporting the workforce to obtain specific skills and experience that will prepare them for their workplace, (c) building the skills and capability of the workforce by supporting educators to participate in professional development, and (d) supporting all services to embed sustainable practices that contribute to workforce stability and reduce the impact of staff turnover (NSW Department of Education, 2018):

*Our stress levels and anxiety over child behaviours have completely disappeared, so we are able to focus and problem solve in the moment. We couldn't do this before because our stress and anxiety got in the way and stopped us thinking clearly. (Educator, Centre 1)*

Once educators had a sound knowledge and understanding of challenging child behaviour, they knew how to prevent it or how to respond to it if prevention was missed. Through the PDP, they developed the skills to manage challenging behaviours in an efficient and effective way, enabling the child to participate more fully in the learning opportunities provided:

*We have learned to replace a challenging behaviour with an appropriate behaviour, just like any other skill that the child needs to learn ... like learning to use scissors or jumping with 2*

*feet, as opposed to something scary for us to stress about. This normalised it for us. (ECT Director, Centre 1)*

This comment ties directly back to one of the main findings in the study on parental perceptions (Blackmore et al., 2016), which identified that parents believed that positive developmental change in their child was the direct result of service quality and the skills and knowledge of the staff. They also valued staff knowledge of child development and the importance of nonverbal communication that the staff were able to pass on to them, which enabled them to have more realistic expectations of their child's development (Blackmore et al., 2016).

Educators were not only better placed to support children with ASD but also became more attuned to all children and drew on the knowledge gained through participating in the PDP in supporting their approach to behavioural management and responsiveness at a room and centre level: 'I am able to pick up on subtle cues in every child now and respond to them sensitively. This prevents most behaviours from ever occurring' (Educator, Centre 2). An ongoing challenge faced by many interventions is the lack of sustainability and contextual relevance. In the current study, shifts in practice were embodied across the service and were seen as a meaningful component of future planning and practice: 'Because this process has pulled our team together with a united focus and approach, we will continue to apply this model ... it has empowered us as educators and it has empowered the children' (Educator, Centre 1).

## **6.6 Discussion**

Findings from the current study attest to the effectiveness of a PDP, based on the ESDM teaching principles, in enhancing the capacity of early childhood educators to include children with ASD in mainstream ECEC settings. Although the inclusion of children with ASD into mainstream ECEC settings has increased over the past decade, many educators lack the specialist skills required to effectively engage and teach children with ASD, resulting in educators feeling ill-equipped and overwhelmed. Findings from the current study showed participation in the PDP resulted in increased confidence and competence in working with children with ASD and their families. Moreover, the

benefits generalised to all children, thus improving the behavioural and emotional climate of the service as a whole.

Staff stress, burnout, and high turnover have been issues experienced across the sector when including children with ASD and challenging behaviours (Grace et al., 2008). A 2015 Australian Education Union survey found that 61% of respondents in NSW claimed that their preservice training and professional development had not given them the skills, confidence, and expertise to teach children with ASD (NSW Department of Education, 2019). In 2016, the Auditor-General reported that teachers felt they lacked skills and strategies and needed greater support to help manage the challenging behaviours and mental health needs of children with ASD (NSW Department of Education, 2019).

A notable finding from this study was the reduction in stress experienced by participating educators that was largely attributed to the reduction in maladaptive behaviours evidenced among the children with ASD, a pattern of results supported by findings from previous studies suggesting that the ESDM program may be an effective tool in not only improving core developmental domains but also decreasing maladaptive behaviours in preschool-aged children (Fulton et al., 2014). This finding is important, given previous research demonstrating the negative impact of maladaptive behaviours and developmental delays on the child's learning acquisition and the development of social relationships with both peers and educators (Berg et al., 2000). The relatively quick reduction in maladaptive behaviours observed in the Fulton and colleagues (2014) study may allow children to participate more effectively in and benefit more from learning opportunities, including the intervention itself, and may be a key factor in the developmental gains observed in previous research (Dawson et al., 2010; Eapen et al., 2013; Fulton et al., 2014; Vivanti et al., 2013).

A particularly encouraging finding was the impact that the intervention had not only on children with ASD but also on the quality of each service as a whole. Educators participating in this study reported that the PDP and ongoing GP enhanced the delivery of their pedagogical practices. Notable enhancements in practice and improvements in the social and emotional climate of the service stands in sharp contrast to previous work, which has raised concerns regarding the potential negative impact associated with high demands related to the educational needs of children with ASD taking



priority over all children (Hornby, 2014). Despite an initial reluctance to minimise physical environments (competition for the child to attend to adults), educators in the current study were able to see the benefits for all children in terms of more productive and more cooperative play.

According to Vivanti and colleagues (2014), the implementation of the ESDM in group settings potentially posed many challenges that could discourage educators from embedding evidence-based early intervention in these group programs. These challenges included potential difficulties in addressing specific learning needs of individual children within the group, difficulties in ensuring the quality of the therapy delivered within constraints of the regular ECEC environment, the risk of segregation, and the lack of family involvement. It was anticipated that these would be compounded in a mainstream ECEC setting; however, the current results demonstrated that each team was able to overcome these barriers with additional support, following the targeted PDP.

Building skills and capabilities across the ECEC sector by providing professional development and mentoring to educators is an initiative of the NSW Early Childhood Education Workforce Strategy (NSW Department of Education, 2018). The strategy has identified that targeted professional development opportunities are a key ingredient for educators and teachers. This study has added more evidence to the workforce strategy and provides an example of research influencing practice; as illustrated by one educator, ‘We have applied this knowledge across our entire program for all children because it is promoting a higher level of participation and developmental progress for all ... this is our responsibility as teachers of young children, isn’t it?’.

The providers participating in this study benefited from having a well-trained and empowered team of educators who could apply their knowledge to facilitate full inclusion for children with ASD. It was important for them to understand why they were doing what they were doing and why it worked for the children and for themselves. To this end, it is important to facilitate access to PDP opportunities in ways that are specialist by nature and sustainable. Targeted professional development strategies need to be accessed flexibly and in the most cost-effective way (NSW Department of Education, 2018).

### **6.6.1 Limitations of the Study**

The data presented in this paper are part of a broader study and the findings are best considered together with other components of the research (Blackmore et al., 2016; Fulton et al., 2014). It is also important to note that the centres involved in this intervention were high quality, with experienced pedagogues and very good teacher–child ratios (see Table 6.1). Given this, the robustness of these findings need to be considered within the context of these supports, and it is recommended that this work be replicated across a range of centres and educational contexts with the possibility that results may not be as good if implemented in lower quality centres with much poorer teacher–child ratios.

## **6.7 Conclusion**

The rising demand for inclusion of children with ASD has created a gap between the promise of inclusive education and the lived reality, which has resulted in low expectations, social exclusion, and inadequate educational outcomes for these children (NSW Department of Education, 2019). In support of these findings, the pre-test interviews guiding the development and implementation of the PDP demonstrated that the rising demand had created stress, anxiety, fear, and loss of confidence across the early childhood sector when endeavouring to support inclusion.

Surveys of educators in NSW schools have highlighted the need for greater support and evidence-based strategies for managing child behaviour and for including children with ASD in their programs (NSW Department of Education, 2019). This was consistent with data collected from all educators participating in this study. It was feasible to apply an evidence-based early intervention to mainstream ECEC settings through a targeted PDP. Participant uptake and positive child outcomes, combined with adherence to the model, reduced staff stress, anxiety, and fear, suggesting that the application was acceptable to all stakeholders.

The benefits of engagement with ECEC services extended beyond child outcomes to the educators, who were the focus of this study. This suggests that the application of an evidence-based model of intervention, when applied via targeted professional development with follow-up support and mentoring, can help educators to develop competence and confidence in applying the teaching principles required to engage children with ASD in a high level of participation. Of equal importance,

it also equipped them to prevent, manage, and replace the challenging behaviours of these children. Although Australian Government policy supports the inclusion of children with ASD in mainstream early childhood services and subsidy schemes to support these policies are embedded in the system (Australian Government Department of Education and Training, 2006), the effective achievement of this requires a specialist skill set that can only be realised through additional targeted professional development.

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# Chapter 7: Discussion and Conclusion

## 7.1 Overview

This chapter summarises the key findings and contributions of this thesis to the research literature and to early childhood pedagogy and practice. The principal findings have been presented in detail in each of the published chapters – Chapter 3, 4 and 6 – so in this chapter they are briefly restated with final conclusions offered. Some consideration is also given to ways in which these studies could be extended to the early education sector more broadly. Finally, this chapter concludes with a discussion of the limitations of this body of work and recommendations for future research. This chapter was not prepared for publication.

This study examined the suitability and impact of an evidence-based autism specific intervention approach when delivered by mainstream educators across a range of Early Childhood Education and Care (ECEC) settings. The introductory chapter established: (a) the need for evidence-based early intervention approaches to address the range of developmental challenges faced by children experiencing Autism Spectrum Disorder (ASD), their families and their educators; (b) the importance of early identification; and (c) the challenges presented by the high prevalence of ASD within mainstream early childhood educational settings and the sparsity of bespoke services.

In light of these considerations the Early Start Denver Model (ESDM; Rogers and Dawson, 2010) was identified as an appropriate approach for adaptation to mainstream ECEC services because of its heavy utilisation of normative developmental constructs (i.e., imitation, communication, joint attention and social development), rigorous manualisation and training processes, explicit play-based curriculum, and promising early evidence for its efficacy for a diverse range of children (Holzinger et al., 2019; Vivanti et al., 2018; Vivanti & Stahmer, 2021). For a model to be deemed to be evidence-based, it must be shown to be effective by multiple research teams in multiple locations (Reichow, 2012; Reichow et al., 2008). Of equal importance, once research suggests that models are effective when implemented in clinical settings by highly trained clinicians, it is also critical to evaluate whether the intervention is effective in community settings, where implementation is undertaken by

community practitioners who may not be as highly trained and may be less closely monitored (Smith et al., 2010). This was one of the guiding principles for Study 3 presented in 6.

ASD is now recognized as a significant public health concern because of its early onset, life-long continuance, and high levels of associated impairment (Christensen et al., 2018). The increasing prevalence of ASD, to a current estimate of 1 in 54 children (Christensen et al., 2018), has resulted in an escalating demand on educators in mainstream ECECs, to take on the role of providing this important early intervention. This presents both pedagogical and professional challenges. At the time of conducting this PhD research, there was no evidence to suggest that mainstream ECECs are equipped to deliver such services to young children with ASD and guidelines to support this process were non-existent.

The need for this specialist training for all professionals working with children with ASD lies in its impact on the young child's brain development, which results in abnormal development of the neuro-circuitry responsible for social cognition. This in turn impacts the behavioural and functional domains dependent on these early processes (Dawson, 2016). Hence, the impairment experienced by young children with ASD is an outcome of the core symptoms of ASD as well as the range of conditions often experienced by individuals with ASD. These include emotional and behavioural problems, sleep disturbances, eating problems, heightened sensitivities, learning disabilities, as well as co-morbid health and mental health diagnoses (Maskey et al., 2013).

The co-existing conditions seen in children with ASD can be of equal or greater concern for parents and educators than the core features, and have a significant impact on behaviour regulation, learning acquisition, and developing relationships with others (Pearson et al., 2006). Such impacts on a young child creates substantial barriers to their inclusion and participation in mainstream ECEC services. While current research is showing that intervention in the first years of life offers the best outcomes for children with ASD (Whitehouse et al., 2020), it is important that they are afforded opportunities to access high quality, evidenced-based intervention in naturalistic educational settings, ideally in their own communities. This stance was the primary motivation for this thesis.

## **7.2 Summary of Key Findings**



The three published studies presented in this thesis were framed around the overarching goal to design and develop of a professional learning program that supports educators to implement an evidence-based naturalistic intervention in mainstream ECEC settings, so that young children with ASD could benefit from participating fully in quality intervention in their local communities, alongside their typically developing peers. To realise this possibility, it was essential to first achieve two supporting goals, which were to:

- i. Identify an evidence-based intervention that reduced challenging behaviours in young children with ASD, which represents the major impediment to the successful inclusion of children with ASD into mainstream ECECs. In the ESDM, we found an evidence-based NDBI that significantly addressed the issue of challenging behaviours. This is detailed in Study 1.
- ii. Identify key priorities amongst parents of children with ASD to determine where they wanted their child to be educated. Their attitudes and priorities were of critical importance in terms of embedding the parent voice in the intervention process. This is detailed in Study 2.

These first two studies provided the justification for Study 3, which sought to embed the educator voice in the intervention and evaluation process. Study 3 was designed to build educator capacity, specialist skills, and confidence to engage children with ASD to a high level of participation and respond to their challenging behaviours.

The rationale for early intervention and evidence-based practice was first examined (see sections 2.3 and 2.4). Then, different approaches to early (section 2.5) and inclusive (section 2.6) intervention were considered. On the basis of this analysis, the ESDM emerged as a viable and suitable approach for delivery in mainstream ECEC settings. Elements of the ESDM approach were examined, considering their appropriateness for reducing maladaptive behaviour in children with ASD and for their use within mainstream ECEC settings. The review of literature and examination of practice-based considerations presented in Chapter 2 established that the ESDM approach is a viable and promising candidate for early intervention for children with ASD when delivered by (trained) educators within specialised settings. This acknowledgment followed analysis that contrasted the ESDM with other approaches.

Both Study 1 and Study 3 could be considered as examples of research determining efficacy in community settings, implemented by community practitioners; Study 1 in a community-based specialist group setting and Study 3 in community-based mainstream early education group settings. The findings of Study 1 suggest that the ESDM program may be an effective tool in improving not only developmental outcomes, but also decreasing unwanted behaviours in preschool-aged children. This finding was important given that previous research has demonstrated the negative impact of maladaptive behaviours and developmental delays on the child's learning acquisition and the development of social relationships. The relatively quick reduction in maladaptive behaviours – with 68% of children in the sample showing a significant decrease in maladaptive behaviour by 12 weeks – may afford children the opportunity to participate more effectively in and benefit from learning opportunities, including the intervention itself. The rapidity in which the maladaptive behaviours decreased may also account, in part, for the developmental gains observed in the present study and also seen in previous research (Dawson et al., 2010; Eapen et al., 2013; Vivanti et al., 2013). Findings from Study 1 also add to the emerging evidence base supporting the effectiveness of a group-based version of the ESDM.

Study 3 built on Study 1 by demonstrating the ecological and educational value of the ESDM. Study 3 represents the first attempt to examine the fidelity of ESDM implementation with mainstream non-specialist early childhood educators. The importance of Study 3 lies in its applicability to implementation of early intervention for children with ASD in more naturalistic, mainstream contexts, which also presents a potentially more sustainable and affordable approach. The findings from both studies (1 and 3) also contribute to the evidence base for the effectiveness of ESDM as an early intervention for young children with ASD.

The three studies presented in this thesis were designed to contribute toward the overarching goal of developing and evaluating an evidence-based professional learning program designed to support the inclusion of children with ASD in mainstream ECEC settings. This thesis is unique in its focus because it incorporates each of the key parties within the inclusion context: children, parents, and educators. Study 1 explored the effectiveness of the ESDM for children, Study 2 considered the parental perspective and their perceived priorities with respect to the need for inclusive early

education, and Study 3 focused on the empowerment and upskilling of early childhood educators, while tapping into their perspectives on the effectiveness and applicability of the ESDM within ECEC practice settings.

### **7.3 Barriers and Facilitators to Inclusion of Children with ASD**

In this section the main findings of the thesis are discussed in more detail and in relation to the challenges of providing inclusive evidence-based intervention for children with ASD in mainstream ECEC services.

#### **7.3.1 Reducing Maladaptive Behaviours**

Study 1 piloted the initial investigation of an ESDM approach delivered by (trained) ECEC educators to address behavioural concerns in preschool-aged children with ASD. As noted, this study showed significant reduction in maladaptive behaviours in 79% of the sample (Chapter 3). Whilst these initial findings were very encouraging, the intervention environment involved a specialised service that differed from a mainstream ECEC service in important respects. The service differed with respect to both staff and child cohorts in the following respects: the staff comprised a multidisciplinary team including teachers, educators and allied health staff; specialist ESDM training was provided for every member of the multidisciplinary team; there was a 1:4 staff to child ratio (comparatively lower than mainstream ECECs ratio of 1:8 or 1:10 for the equivalent age group); and every child had a diagnosis of ASD, so there were no typically developing children in this setting.

Notwithstanding these important differences, the findings presented in Chapter 3 established that the ESDM approach could not only reduce challenging behaviours in a cohort of children with ASD but could also be delivered at fidelity by regular educators who had undergone the rigorous training and certification processes in this model. Therefore, it was important to find out if this effect (delivery with fidelity) could be replicated across multiple mainstream ECECs with regular teams of educators.

Behavioural issues in children with ASD are the greatest impediment to their learning alongside same age peers. Behavioural issues in an ECEC setting can often be the outcome of

incompatibility between a child's atypical learning needs and the ability of the educator to understand and cater for these effectively. According to Baglieri and Shapiro (2016), children with emotionally disturbed behaviours need to be included in mainstream education to allow them to interact with peers who are typically developing, so they are provided with constructive role models. Although there has been increased interest in the concept of inclusion over recent decades, there remains an absence of empirically sound research attention to guide policy and practice for including children with challenging behaviours (Wysocki, 2018). Hence, considerable debate continues to surround the merit of including these children in mainstream settings. The potential benefits of inclusion are further challenged by lack of knowledge and persistent feelings of helplessness and frustration reported amongst non-specialist educators (Contaldo et al., 2020; Vivanti et al., 2014; 2016; 2018; Wysocki, 2018).

The review of the literature on educator's attitudes toward working with children with challenging behaviours presented in chapter 2 showed educators are resistant to full inclusion, which often stems from feelings of incompetency (Contaldo et al., 2020; Vivanti et al., 2014; 2016; 2018; Wysocki, 2018). More positive attitudes, however, are reported following specialist training and the most positive attitudes towards inclusion of children with challenging behaviours is found among educators who receive disability focussed professional learning opportunities (Wysocki, 2018). This points to an important connection between educator attitudes and their level of specialist knowledge, which could go a long way toward explaining why challenging behaviours remain one of the greatest barriers to the inclusion of children with ASD. Understanding the influence of capacity building and professional learning on inclusion practices was certainly a driving motivation behind this research.

Children with ASD need educators and settings that can be flexible and responsive, yet the literature review foreshadowing this research demonstrated that this was not common across the educational sector, while also showing that educators lacked the necessary knowledge to be responsive to the needs of children with ASD or flexible in their approach to learning. This is why Study 1 was critical in determining the direction of Studies 2 and 3. Children enrolled in ECECs come from the full range of social, economic, cultural and ability groups, resulting in a wide variation in life experiences ensuring diversity as a common characteristic of early childhood education in Australia

today (Queensland Government Department of Education, 2018). Furthermore, one in five of these children are developmentally vulnerable across the domains of communication, imitation, social skills, play skills and behaviour (Shahaeian & Wang, 2018). Notably, the inclusion of children with developmental delays in mainstream ECECs has increased since the commencement of this thesis, making Study 3 even more relevant in contemporary Australia (Contaldo et al., 2020; Vivanti et al., 2014; 2016; 2018; Wysocki, 2018).

The peak early childhood advocacy body in Australia, Early Childhood Australia (ECA), defines inclusion as every child having access to, participating in, and experiencing positive outcomes from ECEC programs (Mackenzie et al., 2016). Arguments for inclusive educational practice are underpinned by research on child development, child rights, legal standards and quality ECEC practices (Mackenzie et al., 2016). The importance of high quality ECEC is fundamental in supporting children to build strong and positive relationships and positive identities both as an individual and as part of a group (Peisner-Feinberg, 2014; Torii et al., 2017). Building these capacities in children is fundamental to a sense of belonging and acknowledgment of children's rights (Queensland Government Department of Education, 2018). While variation in definition and understanding exists, the common thread of inclusive practice reiterates access to settings with same-aged peers. The Early Years Learning Framework (DEEWR, 2009) states that early childhood inclusion must take into consideration the diversity and vulnerabilities of young children in decision making processes around curriculum. The National Quality Standards (Australian Children's Education and Care Quality Authority [ACECQA], 2017) also promote inclusion in a way that references each child's differences across the defined quality areas, which offers certain guidelines as to how ECECs can meet expectations in terms of inclusion.

Despite this regulatory (EYLF and NQS) support for inclusion and recognition in the sector on the importance of inclusion, the guiding documents for ECEC fall short of recommending specific strategies that could provide a guiding structure for educators, potentially enabling them to feel greater confidence in making these adjustments and understanding how to meet the needs of these children. The comprehensive intervention outlined and evaluated in chapters 5 and 6 – One of the Kids PLP – responded to this need and makes an important contribution to the sector through the

provision of an evidence-based structure for supporting children with ASD in mainstream services while at the same time aligning with the key practices and principles captured within the EYLF.

### **7.3.2 Empowerment of the Parent Voice within Inclusion Education**

The second study, detailed in Chapter 4, investigated the perspectives of parents who had enrolled their child with a developmental disorder in mainstream ECEC services. The goal of this study was to strengthen the parent voice as part of the intervention process. The findings of this qualitative study showed parents' primary motivation for enrolling their child(ren) in a mainstream ECECs was to benefit from social interactions with typically developing peers. Listening to and valuing parent perspectives was an important rationale for pursuing the overarching goal. An elevation of parent voices is an integral component of effective integration and should be used to inform policy decisions regarding the practical implications of inclusion (Taylor et al., 2017).

The findings of Study 2 also underscored a communicative disconnect between the parents of children with ASD and the educators endeavouring to include them. Lilly (2014) examined enrolment processes for families of children with ASD in educational settings in Australia and coined the term 'autism inclusion disorder', highlighting the extent of difficulties experienced by parents navigating this process in mainstream settings. She found that the communication styles of mainstream personnel were excluding of parents and their children with ASD, to the point of reinforcing a discourse of exclusion (Lilly, 2014). In contrast, Wong and colleagues (2015) found that enhanced styles of communication created better information pathways and communication channels between educators and families, resulting in more efficient systems and allocation of resources. A greater appreciation of the parent perspective, on the part of the educator, could lead to a more effective and efficient inclusion process for children with ASD and their families (Taylor et al., 2017).

In support of this conclusion, the Hunter Institute of Mental Health Study (Centre on the Developing Child Harvard University, 2014) found that when parents of children with additional needs were well supported by educators, they gained a greater understanding of ASD and increased confidence in nurturing their own child's learning and development. A highly skilled educator not only benefits the child from an educative perspective but may also enhance parenting effectiveness

due to reduced stress and concerns over the developmental outcomes and future successes of their children (Iadarola et al., 2019). Positive attitudes are an outcome of increased knowledge, understanding and skills related to child disability (Taylor et al., 2017). The parents in Study 2 spoke to their concerns regarding the lack of knowledge and expertise in ASD demonstrated by educators across mainstream settings, which resulted in a lack of confidence in educators endeavouring to include these children within mainstream educational contexts. The lack of knowledge, understanding and skills in educators acted as a barrier to supporting these families.

The inability of education staff to act as the informed conduit for families reinforced the need for Study 3 and the design and development of a targeted professional development program for mainstream educators. Of equal importance, arguably, is the need to extrapolate the workings of the PLP into the parent population in order to build their capacity to create connections and consensus across the key contexts – the home and ECE environments - in which children learn and develop.

Majoko (2017) reported on the level of miscommunication between parents and educators causing disparity in education goals and a lack of agreement on which goals should be implemented for children with ASD. Further, there are few studies which examined educator expectations and perspectives of quality collaboration with parents (Schultz et al., 2016). This dearth of evidence is even more acute in the ECEC sector and highlights the value of Study 2 and 3. The PLP developed and delivered for Study 3 equipped educators with the Curriculum Checklist (Rogers & Dawson, 2010), designed to assess child abilities and needs, which was underpinned by the development of pedagogical skills in how to develop individual child goals and break these down into a task analysis of teaching steps to carefully scaffold child learning. This approach engendered consensus among educators and parents, as well as consistency in their approach to children. It brought them all onto the same page, enabling them to work as a team to support children with ASD.

Research cited since the publication of Study 1 and 2 speaks to the general agreement of social inclusion as a worthy goal, while at the same time highlighting the need for more effective educative and social strategies for achieving this for children with ASD (Mojoko, 2017; Sosu & Rydzewska, 2017; Taylor et al., 2017; Vlachou et al., 2016). According to Sosu and Rydzewska (2017), the process of creating effective inclusion for children with ASD requires the mutual understanding and

collaboration of parents and educators. Sosu and Ryzewska (2017) found 90% of UK parents agreed on inclusion as a worthwhile goal for their child and 72% agreed that a mainstream setting is the best learning environment for their child with additional needs, with 70% also believing that inclusion benefits typically developing children as well. This desire for inclusion on behalf of parents of a child with ASD, contrasts sharply to parents of typically developing children, who express concerns ~~on a~~ ~~practical level,~~ especially around how inclusion of children with challenging behaviours would affect their own child's educational experience (Vlachou et al., 2016). These concerns are very real and highlight the value of interventions such as that described in Studies 1 and 3 of this thesis; educational efforts that prioritise the reduction of challenging behaviour and the enhancement of skills needed for effective social and emotional inclusion.

Study 2 illustrated that from a parent's perspective, inclusion is not simply about access. Throughout the interview process, it became very apparent that for parents of children with ASD, the effectiveness of inclusion is grounded in their child's level of participation, the quality of the service, and the skills of the educators facilitating these processes. These insights led to the baseline interviews conducted with educators in Study 3 which clearly demonstrated how these early childhood educators felt ill-equipped and unprepared to include children with ASD across their programs. These feelings led to a significant lack of confidence, stress and anxiety for many of the educators interviewed. This sense of professional inadequacy is consistent with findings from previous research which add emphasis to educators feeling overwhelmed and challenged, while citing limited success in supporting children's learning and behaviour (Petriwskyj et al., 2014). Work by Taylor and colleagues (2015) further highlights the disconnect between educator desire and skills when supporting the needs of children with ASD in mainstream settings, with educators citing a lack of specialist pre-service training to equip them with the knowledge of disorders such as ASD and the skills required to engage these children to a high level of participation and manage their behaviours.

### **7.3.3 Educator Effectiveness as Key to Inclusion Effectiveness**

Educator skills, knowledge and understanding have been identified as barriers to the inclusion of children with ASD in mainstream ECE services. Jansson and Olsson (2006) claimed that offering



inclusive settings removes barriers and provides opportunities for children with additional needs to engage in high quality ECEC, enhancing their learning and development. Yet both Study 2 and 3 found that simply offering a placement for these children did not remove barriers and that these barriers, which sit both within the child and the educational service, were significant for both parents and educators. Baseline interviews conducted with educators in Study 3 identified that educators wanted to support families and foster children's learning and development, however this was limited by feelings of inadequacy and lack of confidence. They identified the need for specialist professional development that would equip them with the skills and confidence to facilitate inclusion and support families at the same high level of quality that they were offering to typically developing children and their families. This was their wish.

It also became evident in base-line interviews, that educators of children with ASD often didn't understand the impact of ASD on each child's learning and development and why this led to other difficulties such as challenging behaviours (Roberts & Simpson, 2016). Majoko (2016) also found that while educators believed in the benefits of inclusion for children with ASD, they also claimed they were not professionally prepared in practice and that their pre-service training had not equipped them with the understanding or strategies to manage their high levels of challenging behaviours. Children with ASD were identified by mainstream educators as the group they felt least confident to manage (Majoko, 2016; Lindsay et al., 2013). This highlights the unique nature of Study 3 of this thesis and the need for the design and development of the professional learning program which addressed each of these identified educator needs.

The EYLF (2011) highlights the developmental benefits of inclusion for all children, which includes those with ASD. This view was reflected in the parent voice captured as part of this thesis. According to Caruana and McDonald (2018) the goal of social inclusion requires a proactive and thoughtful approach to facilitating action and changing conditions that were previously acting as barriers. Findings from this thesis show that inclusive efforts are highly contingent upon educators having specific skills in understanding the social, emotional, and learning needs of children with ASD. Despite many endeavours across the ECEC sector to realise inclusion, barriers to its success still exist and arise from a range of personal, attitudinal, and organisational. Unfortunately, these can

serve to reduce the opportunities educators are prepared to take to make necessary adjustments to their practice and programs to support all children effectively (Livingston et al., 2018).

In 2020, the Department of Education, Skills and Employment (DESE) completed a review of the Commonwealth of Australia Disability Standards developed in 2005. The outcome of this review was to reform the standards in the following ways: i) to empower and support children with disabilities and their families; ii) to strengthen the knowledge and capabilities of educators and providers across the sector; iii) to embed accountability for the Standards throughout the education sector and: iv) to build awareness and capacity in the ECEC sector (DESE, 2021).

This reform called for a reconceptualisation of inclusion, requiring educators to see beyond a child's disability to identifying the barriers for their effective inclusion (Erwin, et al., 2021). The baseline interviews carried out in Phase 1 of Study 3 identified a widespread lack of specialist skills that were required to engage children with ASD in learning experiences and teach them alongside their same-aged peers. This skill shortage resulted from a lack of knowledge and understanding of ASD and had resulted in a significant loss of confidence across the study sample. The level of challenging behaviours presented by children with ASD further compounded feelings of inadequacy, leaving educators across the study sample feeling overwhelmed and ill-equipped. This finding is consistent with more recent findings captured in the DESE study (2021) that revealed inadequate specialist training for educators to engage children with ASD across the ECEC sector which, furthermore, had the consequence of impacting detrimentally on their attitudes and practices. These findings highlight the need for a comprehensive process for identifying barriers to inclusion that go beyond the child to include the broader educational context.

Extensive research both in Australia and internationally highlights the importance of participation in inclusive high-quality ECECs as fundamental to supporting children's learning and development and building a sense of belonging, yet while legislation and funding across the sector have increased access for children with ASD and other developmental disorders, inadequate specialist training for educators to support their participation remains a barrier (Kemp, 2016). Studies in this thesis demonstrated that promoting full participation for these children was contingent upon building educator capacity. While barriers exist, opportunities for children's participation in learning will be

reduced. Livingston and colleagues (2018) claims that inclusive practice is also contingent upon reflective practice, educator commitment, and teamwork. While findings from Study 3 reinforce this claim, they also showed that reflective practice, educator commitment and teamwork were notable outcomes of the targeted PLP delivered to all educators. In the following section, the key elements of the PLP are discussed in more detail.

#### **7.4 One of the Kids PLP: Key Components for Effectiveness**

The third study in this thesis, detailed in Chapter 6, investigated the viability of applying an evidence-based model of intervention to mainstream early childhood educational settings via a targeted Professional Learning Program (PLP) to address and ameliorate children's challenging behaviours and enhance educator confidence and skills. The findings of this published study found that the benefits of engagement with mainstream ECEC settings extended beyond child outcomes to educators who were supported to develop the knowledge, understanding, and strategies to engage and teach children with ASD and understand and respond to their behaviours. Findings from this research demonstrated that with carefully targeted professional learning, followed by regular guided practice, educators were able to overcome barriers, by building confidence in their own skills to realise full inclusion within their services. Of equal importance, the children with ASD across these high quality services were fully participating alongside their peers, in all aspects of the daily program.

A significant contribution to the ECEC sector, in the form of a PLP, was the major outcome and contribution of this study. An evaluation of this intervention highlighted several key methodological and pedagogical components necessary for ensuring educator effectiveness *and* reductions in children's maladaptive behaviours. It is important to note that the focus of Study 3 was on educator impact *not* child behaviour. While a measure of child behaviour is part of the fidelity process and used to inform educator practice it was not employed as an outcome measure in determining the effectiveness of the PLP. The need to incorporate measures of both child and educator effectiveness is addressed in more detail at the end of this chapter within the context of research limitations and directions for future research. The following section identifies key facilitators inherent to the

intervention and discusses how this approach aligns well with the priorities and practices typical of mainstream early childhood pedagogy and practice.

The identification of barriers previously outlined was the first step in the process of Study 3, ensuring that the foundation of design and development of the PLP was built on a deep understanding of how these barriers were impacting children, their families, and their educators. In addition to the lack of participation of children with ASD in all aspects of the daily program, including free play, group times, routines, and transitions, was the level of challenging behaviours that were limiting their engagement in learning experiences and interactions with peers. Educators found children with ASD to be disruptive to the program, creating a level of concern and fear in their peers that caused a reluctance to include them in their play. These attitudes were common among participating educators and led to exclusion, rather than inclusion, of children with ASD from group experiences, even in services rated as high quality (i.e., exceeding the National Quality Standard).

The EYLF coined the term ‘intentional teaching’ to encourage purposeful, thoughtful, and deliberate practice (DEEWR, 2009). By adopting the evidence-based approach of ESDM across the two tiers of PLP, educators were specifically trained and mentored to engage in intentional teaching with all children, an inherent component of the approach as defined by the thirteen teaching principles (Rogers & Dawson, 2010). These teaching principles ensured that every educator understood why they were doing what they were doing, and which strategy was required in every teachable moment for children of all abilities (Epstein, 2007). Intentional strategies to include children with additional needs in an ECEC should incorporate small group sizes and the careful choice of materials and learning experiences that build on each child’s strengths, interests, and abilities (ACECQA, 2017). The embedded ESDM curriculum checklist was designed to help educators to identify, with accuracy, each child’s strengths, interests, and abilities, thereby supporting an individualised and differentiated approach to teaching. While this was a novel practice for participants, it enabled them to know exactly where to start their teaching with each child, not just the child with ASD. Of equal importance was to know why and how they were teaching certain skills. This child assessment data afforded them to plan learning experiences that were within each child’s zone of proximal development (Bruner, 1984).

From the perspective of educators, the ESDM Curriculum Checklist enabled them to become effective in their responses to a diverse range of child needs (Petriwskyj et al., 2014).

Along with intentional approaches to instruction, the EYLF also prioritises the importance of play-based learning and play-based pedagogies. According to McLean (2016), a commitment to a play-based pedagogy means educators are more responsive to the needs, interests, and strengths of children with additional needs leading to a naturally inclusive setting. Findings from the current thesis suggest that while play-based pedagogies may be a necessary condition, and indeed have garnered extensive research support as being best suited for working with young children, they are insufficient to ensure effective inclusion. The three services included in Study 3 all embraced play-based pedagogies prior to being involved in the PL but remained challenged by the inclusion of children with ASD. And whilst they were already following the principles of adapting their learning environments and materials with the aim of promoting optimal learning experiences, as outlined by McLean (2016), it wasn't until they had participated in the PLP which specifically addressed and responded to maladaptive behaviours in children with ASD, that they felt they were able to achieve a more inclusive approach to education, in terms of facilitating a greater level of participation across the daily program for these children.

The role of the educator, as integral to supporting all children's learning and development, came into sharp focus throughout Study 3. Findings from this study suggest that a lack of specialist knowledge and skills in educators was the key barrier to inclusion and following intensive specialist training and mentoring, their play-based pedagogies were more embracing of all learning possibilities that could facilitate inclusion (Bera, 2018; McLean, 2016; Zosh et al., 2017). They reported increased competence and confidence following their participation in the PLP. This was reflected in their ability to extend the engagement of children with ASD throughout the day and incorporate their learning goals effectively within play-based experiences, inclusive of all children across the setting. Hence the effectiveness of interventions for children with ASD in mainstream ECECs, was found to be contingent on educators' professional knowledge and skills (Pellecchia et al., 2015). The rationale of the PLP was to provide a paradigm that addressed the need to build specialised educator capacity, while also promoting a shared understanding and consistency in approach across each team.

### **7.4.1 Assessment and individualised planning and practice**

Assessment of children's learning needs is a vital consideration in this dialogue and even more critical when it comes to supporting children with additional needs such as ASD (Centre for Education Statistics and Evaluation [CESE], 2020). For educators to cater for and respond to individual learning needs (McLean, 2016), they require strategies and tools for both determining need and for measuring impact on each child's learning and development (Cloney et al., 2019). If the purpose of assessment is to enable educators to support each child's development, then it is necessary for the assessment to be based on evidence. The ESDM Curriculum Assessment tool is an evidence-based tool embedded into PLP process to support educators to identify, differentiate and individualise their support for children. While educators found this a daunting task initially, they became very familiar and confident with its implementation following the PLP process (see Chapter 2 section 8.2). The ESDM Curriculum Checklist provided clarity in setting realistic goals for the children in their care and consistency across the team. It also afforded educators the opportunity to monitor child learning progress against agreed criteria, enabling them to see the impact of their pedagogy and practice (Wood, 2014). The ESDM Curriculum Checklist provided educators with the knowledge, specific skills, and an appropriate tool to assess children's learning and development (Wood, 2014).

Reviews of early childhood educational assessment (Cloney et al., 2019) show that the development, validation, and application of new assessment tools is a necessary step forward in ensuring effective, responsive and individualised educational approaches within ECEC, and one that requires collaboration with researchers and other stakeholders. The ESDM Curriculum Checklist, utilised for this research, is an example of such a tool. It is a comprehensive early childhood developmental assessment tool that, while specifically designed for children with ASD, is based on typical child development, prompting the educators in Study 3 to use this tool with all the children in their settings. They made this decision themselves following the PLP process, because of its usefulness in guiding their pedagogical practice and achieving their learning outcomes. Educators in the study also believed the tool provided them with a platform that could be shared across the team, supported transparency and communication, and underpinned their whole team approach to pedagogy and practice.

#### 7.4.2 Alignment between the ESDM and key components of the EYLF

The relationship between play and pedagogy in terms of learning outcomes is complex and interpreted differently across the ECEC sector (Hedegaard & Fleer, 2013). While the EYLF (2011) promotes learning through play and intentional teaching as evidence-based practices, there is little consensus amongst educators on a definition of either, nor is there consensus on the role they should assume within the teaching-play nexus (Kilderry et al., 2017; Taylor & Boyer 2020). Post study questionnaires identified that the PLP developed for Study 3 clarified this confusion for educators by embedding intentional teaching – using the ESDM teaching principles (detailed in Chapter 5 and 6) – successfully in play and daily routines. Educators in the study welcomed this clarity and found that they could finally articulate their role.

Educators in Study 3 also learned through the ESDM Teaching Principle of Dyadic Engagement, that intentional teaching is not their sole responsibility, but one that should be shared with the child. This notion is supported by Hedges and Cooper (2018), who suggest that consideration should also be given to the intentionality of children in the processes of learning through play where proactive interactions involve both the intentional teacher and the intentional learning. The PLP developed for Study 3 aligns well with the EYLF and approaches to early education more broadly, in part, through its prioritisation of intentional teaching practices, where educators are supported to understand and master the strategies needed to become the child's play partner and develop dyadic engagement within joint activity routines (Rogers & Dawson, 2010). The mastering of dyadic engagement took up a significant proportion of mentoring time in the follow-up guided practice, as did the coaching around *antecedent, behaviour, and consequence* (ABC) teaching chains embedded in the ESDM (Rogers & Dawson, 2010). This approach, combined with mentoring around the ESDM Instructional Techniques (particularly the technique of least to most prompting), brought the construct of intentional teaching into sharp focus, affording educators the structure and guidance they needed to deliver ABCs, so that child learning took place, but also ensured that they were promoting greater child independence in the learning process (Rogers & Dawson 2010).

Given that intentional teaching is central to high quality early childhood educational experiences, child-educator relational quality and child learning outcomes, building educator understanding and

mastery of this principle should be prioritised to support teaching and learning across all children (McLaughlin & Sheridan, 2016). The need for clarity around the concept of intentional teaching was identified as a priority in pre-study interviews which formed the foundation of the design and development of the PLP. Following analysis of Study 3 interview data it became clear that there was a great need for improving educator-child interactions for the purposes of instructional support to assist children's thinking and learning (Taylor et al., 2013). This is further supported by Lansdown and colleagues (2014) who claimed that learning outcomes are improved when educators use play as the basis for instructive learning.

A balance of adult framed activities within play-based approaches is recommended by Pascal et al (2019) as essential in supporting children's learning, development, and well-being. This was also mapped directly to the ESDM's principles of dyadic engagement and elaborated joint activity routines, where both the educator and child interact in a reciprocal coordinated manner. In this type of interaction, both adult and child share the lead to achieve balance and co-construction combined with a sharing of turns, materials, gaze, and smiles (Rogers & Dawson, 2010). Offering child choice to begin activities and throughout play-based routines created an empowering learning environment for both the educators and children in Study 3. A sense of agency was shared across a range of enriching experiences and individualised and responsive instruction ensured children's motivation for learning was optimised (Rogers & Dawson, 2010). The *One of the Kids* model of intervention afforded children opportunities to lead play experiences with educators actively scaffolding and building upon child interests in order to extend and enrich it (Krieg, 2011). These practices observed across the three services relate directly to the ESDM teaching principle of optimising child motivation, which incorporates offering child choice and then interspersing child interests with new learning throughout the activity so the child maintains feelings of success and enjoyment, thereby giving them the confidence and motivation to learn new skills (Rogers & Dawson, 2010).

### **7.4.3 Increased relational quality and reductions in maladaptive behaviour**

Relational pedagogy is at the core of effective ECEC provision and serves as the basis for creating rich and responsive teacher-child interactions. The PLP was designed to equip educators with the



skills that enabled them to build strong and positive relationships with children with ASD so the child viewed them as a play partner with whom they could have fun. This is a complex process, requiring educator responsiveness and ongoing investment in building trusting relationships that create safe, acknowledging spaces for children to be (Albin-Clarke et al., 2018). The ESDM refers to this particular process as sensitivity and responsivity and regards it as fundamental to all other teaching principles in the model, requiring the educator to be completely attuned to each child's emotional state and responsive to each child's communicative cues (Rogers & Dawson, 2010). For the child with ASD, these cues are often non-verbal, requiring an even greater level of sensitivity and responsivity on the part of the educator. Children with ASD benefit most from engaging in play routines with educators who respond to their cues (Cooper & Quinones, 2020).

The growing discourse on the role of positive behaviours and self-regulation is couched within the health and well-being of the young child (Centre on the Developing Child Harvard University, 2014). The ESDM teaching principles embedded in the PLP that relate directly with this discourse include managing transitions, modulating arousal and managing unwanted behaviours, detailed in Chapter 6. It was not until educators had completed the PLP that they could engage in this discourse and overcome their greatest stressor and barrier of challenging behaviours in children with ASD. A certain level of child mental flexibility is required for positive behaviours to be sustained (Centre on the Developing Child Harvard University, 2014). This was achieved through the elaboration phase of the four-part joint activity routines which are the framework for all teaching in the ESDM. Elaboration in play involves continually adding variations to the play, to reduce rigidity in play habits, which is a core feature of ASD (Rogers & Dawson, 2010). By creating flexibility within play and across materials, the child with ASD experiences fewer barriers, hence preventing unwanted behaviours from needing to occur (Rogers & Dawson, 2010).

Of equal importance in preventing unwanted behaviours, was intensive promotion of verbal and non-verbal communication. Because this is another core deficit in children with ASD, they tend to use unwanted behaviours for seeking or avoiding when they don't possess conventional communication skills to have their needs met (Rogers & Dawson, 2010). Baseline interviews found that educators did not have adequate training or skills to promote verbal and non-verbal communication in children with

ASD and were challenged by the unwanted behaviours that resulted. While a solid foundation of oral language and communication is foundational to cognition and literacy development (Pascal et al., 2017), it is also the hallmark of social and emotional learning and development. Casel (2021; cited in Department of Education, 2021) states that intentional teaching of social and emotional skills contributes to long term success. Educators in this study developed the skills and confidence to achieve because they developed a deep understanding of the condition of ASD and its impact on the young child's brain development, particularly in the areas of social and emotional development and communication.

While Chapter 2 highlighted that the strength of the ESDM lies with the comprehensiveness of the training provided to those delivering the intervention, Study 3 identified the weight of consideration that needed to be afforded to the variance in expertise and baseline knowledge in the non-specialist participants who made up the staff teams across the three mainstream ECEC teams. Because there existed an inherent variation in qualifications across Study 3 participants, the existing training approach, Tier 2 (Rogers & Dawson, 2010), was insufficient in addressing this variance. By capitalising on the pedagogical strength of the framework provided by the manualisation of the ESDM (Rogers & Dawson, 2010), coupled with the existing ECEC framework of the EYLF (2010), it was possible to respond to this variance by developing the additional level of training, Tier One PLP (One of the Kids). This PLP involved contextualised learning opportunities, including mentoring and critical reflection to address the differentiated learning needs across each ECEC team. This enabled all study participants, regardless of their qualification status, to be adequately trained and mentored to contribute equally to the application of the intervention program within their mainstream setting. Through the prioritisation of a whole team approach to building educator capacity, the development of a contextualised PLP for both tiers of training did build educator understanding, skills and knowledge through an ongoing mentoring program that reflective practice.

According to Marbina (2015), effective learning and development in children is contingent upon the educator's capacity for critical self-reflection and while the EYLF promotes the importance of this, it does not provide explicit guidelines or tools to help educators achieve it (Brownlee Lunn, 2021; cited in Department of Education, 2021). Study three PLP did provide this this level of

guidance. It incorporated evidence-based educator self-reflection tools, a behaviour coding tool and a fidelity monitoring tool, to ensure that educators, across the teams, had explicit means to consistently engage in critical reflection. The follow up guided practice and mentoring also enabled a peer reflection process that reviewed outcome examples to further support critical reflection. Educators in Study 3 found these tools and peer review processes highly beneficial. This is supported by Cooper et al. (2014) who argue that the process of critical reflection requires dialogue amongst educators. These tools are detailed in Chapter 5 and in Appendix C of this thesis. Harrison and colleagues' (2020) study of quality improvement in ECECs, found that while educators talked of critical reflection, they lacked capacity to consider the theory or research behind it and therefore were limited in their practice and dialogue. The PLP equipped the educators with this theory and evidence, so they learned how to engage in critical reflection and also how to articulate this with each other and with families.

Study 3 findings also highlight the importance of mentoring as a valuable PLP strategy, particularly when implemented in situ (Nolan, 2018). Professional learning that takes place within the educator's daily practice ensures that the learning experience is relevant to their context, allowing them to draw from investigation and evaluation of their own pedagogy (Nolan, 2018). Mentoring practices are highly effective for strengthening pedagogical practice in ECECs (Wong & Waniganayake, 2013). When the mentor acts as a *critical friend* educators are helped to acquire new skills and take on new roles (Waniganayake et al., 2012). In support of this claim, Twigg and colleagues (2013) found that mentoring can lead to a deeper understanding as well as the generalisation of new skills. Mentoring can also facilitate the level of self-reflection required to bring about change, which was fundamental to the guided practice component of the PLP developed for Study 3. This level of mentoring utilised self-monitoring tools to facilitate self-reflection and when these were combined with regular and ongoing targeted support from specialist trained and experienced peers, a deeper level of learning resulted. In addition to this was the reciprocal learning opportunities that ensued, not only building the capacity of educators, but also providing multiple opportunities for the mentors to further develop their mentoring skills. This could result in the increased confidence for both mentors and mentees (Nolan, 2018).

## 7.5 Significance of Findings

The major contribution of this thesis was through the development of a professional learning program and practice framework for building the capacity of mainstream ECEC educators working with children with ASD. One of the most significant changes in early childhood intervention, over recent years, has been a shift from a deficit approach to a more developmental approach that promotes participation of children with ASD (Roberts et al., 2016). Study 3 demonstrated that the promotion of participation for these children is entirely contingent upon building the knowledge, understanding and specialist skills of the professionals endeavouring to include them. Understanding the challenges faced by a child with ASD and their family is of equal importance to an understanding of the challenges faced by the adults working with both groups.

This body of work resulted in the development, implementation, and evaluation of a unique professional development program for Australian educators in mainstream early childhood education and care services, who had previously been struggling with inclusion of children with ASD. The program was theory-based, was integrated with the national Early Years Learning Framework (Krieg, 2011) connected with outcomes from an evidenced-based early intervention approach for children with ASD (Rogers & Dawson, 2010) and tailored to an Australian mainstream education context. This body of work highlighted the strengths of the ESDM in addressing the major barrier to inclusion of maladaptive behaviours, while also demonstrating its ability to embed shared goals across the ECEC and home contexts, thereby increasing opportunities for the practice, mastery and generalisation of skills, which in turn was an important factor in reducing maladaptive behaviours.

The unique contribution to the ECEC sector focused on empowering mainstream educators with specialist skills that enabled them to engage, teach and respond appropriately to the behaviours of young children with ASD included in their services. To our knowledge, this is the first time there has been research focus on educators in non-specialised mainstream services and their capacity to implement the ESDM approach with fidelity. As a result of this extensive work, the Tier 1 PLP: *One of the Kids*, has been approved by NESA (NSW Education Standards Authority; UOW\_ES\_20-12) and adopted by the NSW Department of Education, incorporating regular delivery to mainstream

educators in ECEC settings. It is also being delivered and continuously evaluated by Certified ESDM professionals on the Early Start Team of the University of Wollongong on a regular basis, eliciting very positive feedback from all participants:

Study 3 responded to the specificity and format of professional learning and mentoring that was required across a diverse team of educators, enabling them to implement evidence-based ASD interventions in their mainstream ECECs. Resource requirements, differentiated learning strategies and frameworks that supported and embedded reflective practice were identified and implemented with success to build educator capacity. This professional learning program now has the potential to provide widespread inclusion of children with ASD to participate fully in mainstream programs alongside their typically developing peers.

## **7.6 Limitations and Future implication of the Findings**

There are a number of limitations of this research. Firstly, the three studies spanned a period of eight years. The length of time since commencement therefore may make some arguments behind the need for Study 1 less relevant within the current context. The size of the Study 3 sample, three ECEC services, comprising 53 staff, is a further potential limitation to providing intervention for children with ASD. Another limitation in terms of replication, is that the three ECECs participating in the study were all rated as Exceeding the National Quality Standard (NQS), with experienced pedagogues and good educator-child ratios. Given these limitations, the findings need to be considered within the context of these supports and it is recommended that this work be replicated across a range of ECECs, particularly those with poorer quality ratings and educator to child ratios. Follow-up studies are also required to determine whether the increased educator capacity reported post PLP intervention is maintained, which could have the potential to foster widespread inclusive educational opportunities for children with ASD and their families.

While these limitations were a necessary component of managing the delivery of the professional development within the context of a PhD study, they limited the generalisability of the study across multiple ECECs. Despite these limitations, the study still allowed for a novel approach to building workforce capacity in an area that had previously been hampered by stress, anxiety and feelings of

inadequacy, when it came to including children with ASD in mainstream ECECs. This approach empowered educators with critical thinking skills (Harrison et al, 2020) as well as specialist skills and confidence to include these children and could now be replicated.

Further limitations of this research, in terms of Study 3, include the absence of child outcome measures, due to the focus on educator outcomes. Recent research has started investigating the links between fidelity to the ESDM approach and child outcomes (Zitter et al., 2021). Rogers et al (2018) found a direct correlation between improvements in parent-mediated intervention and increased skill development in their children. This finding was endorsed by Waddington et al (2020) who found that when parent-mediated ESDM intervention (P-ESDM) was delivered at fidelity, there was a direct association with increased child engagement and improved communication skills. While Zitter and colleagues (2021) found that variations in ESDM practitioner fidelity contributed to the learning response in children with ASD, therapist fidelity to the ESDM played a significant role in child capacity to learn new skills in response to the delivery of the intervention. While future research should incorporate child assessments, the measures of fidelity utilized in this study served as a 'proxy' for child measures and are indicative of child level impact. Future research could extend on Zitter's work to investigate if these strong connections extended to increased educator capacity in mainstream group settings and improved child outcomes.

While the initial findings presented are encouraging, several questions need to be addressed in terms of viability of the extensive level of PLP in Study 3, particularly in ECECs of poorer quality. For this reason, a larger, and more diverse sample of ECECs including children with ASD would be needed for replication purposes. It could be very beneficial to also investigate the possibilities of delivering the PLP and follow up guided practice remotely, with a particular focus on educators in rural and remote areas of Australia. A program such as the PLP developed for Study 3, could help these ECECs to provide high quality, evidence-based, educator-mediated intervention in these local communities. This has the potential to disseminate more broadly, the application of evidence-based interventions in ECECs across Australia, thereby maximising participation for children with ASD in naturalistic settings. It would be important to manualise the PLP for the purposes of replication. The costs associated with an intensive targeted PLP could potentially limit broader dissemination also.

In light of these potential limitations, future research could also examine the adaptation of the PLP for parents of children with ASD to investigate the capacity building effect in this population. There is a growing body of research supporting parent-mediated interventions (Roberts & Kaiser, 2011; Rogers et al., 2012; Ingersoll & Dvortcsak, 2019). In 2012 Steiner and colleagues also found that parent-mediated interventions are cost effective and help children to generalise their learning in a natural way. Of equal importance, parent-mediated interventions can substantially increase the child's intervention hours, potentially promoting better outcomes for child and family (Ingersoll & Dvortcsak, 2019).

## **7.7 Conclusion**

The findings of this research add to the growing body of evidence for the effectiveness of naturalistic early intervention for children with ASD delivered in a mainstream and community setting. While early childhood interventions should share the common goal of improving a child's experience of the world around them (Sandbank et al., 2019), they are predominantly designed for specialist early intervention settings, rather than naturalistic settings such as ECECs (Vivanti et al., 2018). For this reason, children with ASD have historically experienced a different and perhaps more restricted world of experiences to those of their typically developing peers.

The purpose of each of the studies in this thesis was to determine whether this approach to intervention could be considered at a community level, in mainstream ECECs. Based on practical, sustainable and economic arguments for providing interventions and supports to children with ASD in more naturalistic, accessible ways, the studies have shown some success. While the focus of intervention remains on the child's potential and full participation in society, there could also be savings to public spending associated with a reduction in the need for whole of life supports by investing more broadly to bring about immediate and long-term gains in independence (Productivity Commission, 2017). This outcome however, should not destabilise the principle focus of increasing the participation levels for the child receiving intervention, wherever that may be.

Study 3 found a novel way of achieving implementation of an effective early intervention approach (ESDM) for children with ASD, in mainstream ECECs, by its unique focus on building the

capacity and confidence of educators. This was an example of investing more broadly in the provision of intervention in the early years, at a community level which may lead to greater access and participation for children and improved wellbeing outcomes for their families and educators. It also takes advantage of the extensive availability of ECECs and the emerging preference for educating young children in group settings where they can benefit from the social learning opportunities provided by peers (Vivanti & Stahmer, 2021). The model of delivering intervention in mainstream ECEC settings may also prove to be more sustainable in the long term. Greater access and participation for children with ASD, combined with sustainability and cost savings provide a compelling case for government investment in building workforce capacity across the ECEC sector, especially given the scientific evidence for the ESDM. Furthermore, advocating for inclusion of children with ASD, without building workforce capacity in knowledge and understanding of the condition and its impact on the young child's learning, development and behaviour will continue to be compromised and may result in lower levels of social participation, poorer outcomes, lower levels of employment and greater government expense.

The research presented in this thesis has made an important contribution to the feasibility of embedding evidence-based interventions for children with ASD in the broader and more naturalistic settings of mainstream ECECs in Australia. The findings relating to the design, development and implementation of a targeted PLP illustrate the potential of building educator capacity for the benefit of all parties involved in the inclusion of children with ASD in Australian ECECs. These findings could have worthwhile implications for policy makers in the early childhood sector, with the potential to benefit educators and children with ASD and their families.

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# Appendices

## Appendix A – Thesis Format Agreement



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AUSTRALIA

### Thesis Format Agreement

I agree that the thesis submitted by the PhD candidate, Elizabeth Aylward, has been prepared in journal article compilation style format.

**Principle Supervisor: Associate Professor Cathrine Neilsen-Hewett**

Signature:

Date: 27/02/2022

**Co-Supervisor: Professor Marc de Rosnay**

Signature:

Date: 27/02/2022

**PhD Candidate: Elizabeth Aylward**

Signature:

Date: 27/02/2022

## Appendix B – Statement of Contribution of Others



UNIVERSITY  
OF WOLLONGONG  
AUSTRALIA

### Statement of Contribution of Others

As a co-author on the following papers:

1. Fulton, E., Eapen, V., Crnčec, R., Walter, A., & Rogers, S. (2014). Reducing maladaptive behaviours in preschool-aged children with autism spectrum disorder using the Early Start Denver Model. *Frontiers in Pediatrics*, 2(40), 1-10. <https://doi.org/10.3389/fped.2014.00040>
2. Blackmore, R., Aylward, E., & Grace, R. (2016). ‘One of the Kids’: Parent Perceptions of the Developmental Advantages Arising from Inclusion in Mainstream early Childhood Education Services. *Australasian Journal of Early Childhood*, 41(2), 13-17. <https://doi.org/10.1177/183693911604100203>
3. Aylward, E., & Neilsen-Hewett, C. (2021). Application of an Evidence-Based Early Intervention Model for Children With ASD in Mainstream Early Childhood Education and Care Settings via a Targeted Professional Development Program. *Australasian Journal of Special and Inclusive Education*, 45(2), 135-149. <https://doi.org/10.1017/jsi.2021.11>

I declare that the greater part of the work is directly attributable to the PhD candidate, Elizabeth Aylward. I confirm that the candidate has made contributions in the design of the research, data collection and analysis, and the writing and editing of the manuscripts.

As a supervisor or co-author, I have been involved in the formulation of research ideas and editing of the manuscripts.

**Principle Supervisor: Associate Professor  
Cathrine Neilsen-Hewett**

Signature:

Date: 27/02/2022

**Co-author: Roger Blackmore**

Signature:

Date: 27/02/2022

**Co-Supervisor: Professor Marc de  
Rosnay**

Signature:

Date: 27/02/2022

**PhD Candidate: Elizabeth Aylward**

Signature:

Date: 27/02/2022

**Appendix C – Tier 1 PLP outline (see Vol. 2)**

## Appendix D – Tier 2 ESDM Certification Process - Rogers & Dawson (2010)



# UC Davis MIND Institute ESDM Training Program

## THERAPIST CERTIFICATION

### Overview

Our aim is to ensure that each individual trainee is adequately prepared for the rigorous requirements of completing the therapist certification program. In order to provide the necessary support required of both our trainers and trainees, we have created the following discrete steps towards certification to include:

- 1) Introductory Workshop
- 2) Advanced Workshop
- 3) Therapist Certification Supervision

# UC Davis MIND Institute ESDM Training Program

## Steps to Certification in the Early Start Denver Model (ESDM)

### Prerequisites:

Must have met the requirements for participating in Advanced Workshop.

#### 1) Read the ESDM Manual

Read the training manual entitled, *THE EARLY START DENVER MODEL FOR YOUNG CHILDREN WITH AUTISM: PROMOTING LANGUAGE, LEARNING, AND ENGAGEMENT* (Rogers, & Dawson, 2009). The ESDM is a developmental, naturalistic, and relationship-based approach for fostering children's initiative and engagement and scaffolding their communication and interaction. Included in the manual is the fidelity system for determining correct usage of the interactive procedures and a non-reproducible reference of the CURRICULUM CHECKLIST for evaluation of children's skill levels and development of teaching objectives. The manual and Curriculum Checklist (sold separately) can be purchased online.

#### 2) Attend ESDM Training Workshops

After reading the manual, there are two workshops available for training in the ESDM.

The Introductory Workshop addresses the main aspects of the ESDM but is not intended to train professionals to fidelity. Participants will participate in all workshop activities, including didactic instruction, videotaped exercises, and group discussion.

The Advanced Workshop includes interactive sessions with children with ASD to equip professionals with the information, skills, and resources necessary to correctly implement the ESDM within their organization. Trainees will work daily with children with direct supervision from the Trainer. Trainees' fidelity scores in the ESDM will increase daily, with fidelity reaching at minimum 75% at the end of the workshop. Professionals will be required to submit follow-up training materials to demonstrate their continued competency in the ESDM following the Advanced Training Workshop (details listed below).

## UC Davis MIND Institute ESDM Training Program

### 3) Apply for Certification Supervision

After completion of the Advanced Workshop, please submit a request for certification supervision to your workshop Trainer. PLEASE NOTE: For workshops conducted by The ESDM Training Program at the UC Davis MIND Institute, requests must be submitted to: [eylward@uow.edu.au](mailto:eylward@uow.edu.au)

Once your request for certification is approved you will be sent a link to access the ESDM Certified Therapist application and registration for payment. Your payment includes fortnightly booster coaching sessions and 5 reviews of submissions. You need to be fully registered to be included in these booster coaching sessions.

### 4) Submit Training Materials for Certification

Submit materials according to the Supervision Action Plan below. Timeline and due dates are based on the start date of when you are officially assigned to a supervising trainer.

Although the goal is for trainees to use practice materials to reach fidelity, this has to be completed within the timeline stated in the certification action plan. All steps to the certification process should be completed within 8-14 months from the individual's start date (date assigned to supervising Trainer). In situations in which: (1) any materials are not turned in within the timeline, (2) if the individual does not complete certification steps within 14 months from the start date, or (3) if the individual does not reach fidelity by the end of the training process, the training agreement has been executed and the assigned trainer has completed all responsibilities to the trainee. If the trainee does not achieve certification for one of these reasons, several options exist. The trainee may sign up for and take the Advanced Workshop again and/or the trainee may purchase additional supervision time from their trainer.





# UC Davis MIND Institute ESDM Training Program

## Therapist Certification Supervision Action Plan

### Step Activity Evaluation Trainee Timeline

<p>Step One:</p> <p><i>Curriculum &amp; Objectives</i></p> <p>*Practice Case</p>	<p>Submit a completed ESDM curriculum and 4-5 written objectives across at minimum three different developmental domains for one child.</p>	<p>Trainer provides up to two rounds of feedback related to Fidelity Rating definitions of Items A-C, but scores are not required.</p>	<p>Trainee submits Step One within one month of starting certification program.</p>
<p>Step Two:</p> <p><i>Teaching Steps</i></p> <p>*Practice Case</p>	<p>Submit teaching steps of the 4-5 approved objectives (from Step One) for the same child.</p>	<p>Trainer provides feedback related to Fidelity Rating definition of Item D, but score is not required.</p>	<p>Trainee submits Step Two within one month of receiving feedback for Step One.</p>
<p>Step Three:</p> <p><i>Video</i></p> <p>*Practice Case</p>	<p>Submit one 30-minute unedited video of at minimum three teaching activities of the same child as above and scored data sheet.</p> <p><i>Each recorded activity should be rated by self and peer(s) at minimum 75% fidelity or higher on total fidelity score.</i></p>	<p>Trainer will observe and provide feedback and guidance. Trainer may decide to score with the Fidelity Rating System if skills are well-enough developed.</p>	<p>Trainee submits Step Three within one month of receiving feedback for Step Two.</p>
<p>Step Four:</p> <p>Official Submission</p>	<p>Prepare a complete package of the following materials with one child (may be the same child from practice case).</p> <p>Materials should encompass trainer's feedback from practice case and reflect passing scores across all fidelity measures.</p>	<p>Trainer will score with the Fidelity Rating</p>	<p>Trainee submits Step Four within</p>

	<p><i>It is highly recommended that a peer also rate your materials to ensure accurate fidelity scoring.</i></p> <p>Submission includes:</p> <ul style="list-style-type: none"> <li>• – Completed Curriculum Checklist</li> <li>• – Written objectives of at minimum two objectives per developmental domain</li> <li>• – Teaching steps per written objective</li> <li>• – One 30-minute unedited video of at minimum three teaching activities</li> <li>• – Self and peer-rated fidelity with scores of 80% or higher across videotaped activities</li> <li>• – Scored data sheet of videotaped activities</li> </ul>	<p>System and provide feedback.</p> <p>Trainee will demonstrate at minimum a score of “10” on paperwork and 80% fidelity across all videotaped activities.</p>	<p>two months of receiving feedback for Step Three.</p> <p>Must pass to proceed to Step 5</p>
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Phase	Activity	Evaluation	Timeline
Step Five: Official Submission	Complete Step Five with a new child. Same submission requirements as Step Four apply here with the exception that additional video may not be needed if fidelity standard was met from practice case video.	Trainer will score with the Fidelity Rating System and provide feedback. Trainee will demonstrate at minimum a score of “10” on paperwork and 80% fidelity across all videotaped activities.	Trainee submits Step Five within three months of receiving feedback for Step Four.
Therapist Certification	The individual has achieved the ESDM fidelity standards on paperwork and video materials with two children.		

### Additional Supervision (optional)

Trainees are required to meet certification standards on two “official submissions”. This includes scores of “10” on paperwork and 80% fidelity. Steps 1-3 of the Action Plan are considered practice cases. At the discretion of supervising Trainer, if trainee does not pass 2 “official cases” (Steps 4-5 of Action Plan), he or she will have option to purchase additional supervision at a set rate, in order to have additional opportunities to complete certification.

# Appendix E– Tier 2 ESDM Advanced Training Program Outline



## UC Davis MIND Institute ESDM Training Program

### Steps to Certification in the Early Start Denver Model (ESDM)

#### Prerequisites:

The following steps are intended for professionals interested in becoming certified in the ESDM and who:

- Work regularly with 12-48 month aged children with Autism Spectrum Disorder (ASD)
- Have educational degrees beyond a bachelor's or the academic equivalent from your country of origin (e.g., MA, Ph.D., MFT, SLP, OT)
- Work as part of an interdisciplinary team (e.g., general/special education teacher, developmental/clinical psychologist, SLP, OT, behavior analyst)
- Have the resources to submit training materials (after the workshop is complete) to our center for fidelity review and certification.

#### Step 1: Order the ESDM Manual

Read our training manual entitled, *The Early Start Denver Model for Young Children with Autism: Promoting Language, Learning, and Engagement* (Rogers, & Dawson, 2009). The ESDM is a developmental, naturalistic, and relationship-based approach for fostering children's initiative and engagement and scaffolding their communication and interaction. Included in the manual is the fidelity system for determining correct usage of the interactive procedures and a non-reproducible reference of the **Curriculum Checklist** for evaluation of children's skill levels and development of teaching objectives. The manual and Curriculum Checklist (sold separately) can be purchased online.

#### Step 2: Attend ESDM Training Workshop

After reading the manual, there are two workshops available for training in the ESDM. The Introductory Workshop addresses the main aspects of the ESDM but is not intended to train professionals to fidelity. Participants will participate in all workshop activities, including didactic instruction, videotaped exercises, and group discussion. The Advanced Workshop includes interactive sessions with children with ASD to equip professionals with the information, skills, and resources necessary to correctly implement the ESDM within their organization. Trainees will work daily with children with direct supervision from the Trainer. Trainees' fidelity scores in the ESDM will increase daily, with fidelity reaching at minimum 75% at the end of the workshop. Professionals will be required to submit follow-up training materials to demonstrate their continued competency in the ESDM following the Advanced Training Workshop (details listed below).

**You must bring the ESDM manual to the workshops. Enrollment in the Introductory and Advanced Workshops may be done concurrently.**

**Introductory Workshop:** Learn about the background, principles, assessment, data, and intervention procedures of the ESDM.

Topics include how to:

- Administer and complete a developmental assessment of children's skill levels
- Develop individualized, developmentally-appropriate teaching objectives
- Implement the ESDM teaching practices and fidelity system to evaluate technique use
- Maintain data systems and address poor or limited child progress, when needed

**Advanced Workshop:** Graduates of the Introductory Workshop will learn how to carry out ongoing therapy using the ESDM. Teams of 3-5 professionals will be grouped together to receive direct practice with children with ASD and supervision with implementing an ESDM intervention program. Coaching and feedback will be provided on how to generate and embed a developmentally-appropriate teaching curriculum into naturalistic routines for young children with ASD.

Topics include how to:

- Use the curriculum for evaluating a child's skill level across developmental domains
- Build quarterly objectives and data systems and address poor or limited child progress when needed
- Teach developmental objectives embedded inside naturalistic play routines
- Self-evaluate technique use of intervention strategies.

### **Step 3: Apply for Certification Supervision**

After completion of the Advanced Workshop, please submit a request for certification supervision. All requests need to be submitted to [esdmtraining@ucdmc.ucdavis.edu](mailto:esdmtraining@ucdmc.ucdavis.edu).

***For ESDM Certification, all materials (paper and video) submitted to the ESDM training program need to be translated into English (videos will must have subtitles).***

### **Step 4: Submit Training Materials for Certification**

Two to three weeks after completion of the Advanced Workshop, please submit the following materials to ensure correct usage of the ESDM. ***Materials sent after the submission deadline will not be accepted:***

#### **Practice Child**

##### **Step One: Curriculum and Objectives**

- Trainee will send a completed ESDM Curriculum and 4-5 written objectives for one child across a minimum of three different developmental domains for one child
- Trainer provides up to two rounds of feedback related to Fidelity Rating definitions A-C, but scores are not required.
- Step one must be completed within 6 weeks of starting this step to continue the program

### **Step Two: Teaching Steps**

- Trainee will submit developed teaching steps of the 4-5 approved objectives from Step One into the data system
- Trainer provides up to two rounds of feedback related to Fidelity Rating definition D, but score is not required.
- Step 2 must be completed 1-2 months after completing the Advanced Workshop

### **Step Three: Case Video**

- Trainee will send one 30-minute clip of unedited video implementing the ESDM with one child along with self-rated fidelity and child data per video. 30-minute unedited video of a minimum of three teaching activities of the same child as above and scored data sheet. Each recorded activities should be rated by self and peer(s) at a minimum of 75% fidelity or higher on total fidelity score. If recorded activities are at 80% fidelity or higher, the video will count as one of the two required submissions.
- Trainer will observe and provide up to two rounds feedback and guidance. Trainer may decide to score with the Fidelity Rating System if skills are well-enough developed and count towards submission.
- Step 3 must be completed within 6 weeks of starting this step to continue the program

*Each step of the Practice Child will be evaluated according to the: (1) developmental appropriateness of Curriculum scoring, and selected objectives; (2) progression of teaching steps, and; (3) accuracy of fidelity and implementation of ESDM from videotaped samples. Written and/or verbal feedback of recommendations in each area will be provided by the trainer on an ongoing basis.*

## **Official Submissions**

### **Step 4: Submit First Official Submission**

- Prepare a complete package of the following materials with one child (may be the same child from practice case). Materials should encompass trainer's feedback from practice case and reflect passing scores across all fidelity measures. It is highly recommended that a peer also rate your materials to ensure accurate fidelity scoring.
- Submission includes:
  - Curriculum Checklist
  - Written objectives of a minimum of two objectives per developmental domain
  - Teaching steps per written objective
  - One 30-minute unedited video of a minimum of three teaching activities
  - Self and peer-rated fidelity with scores of 80% or higher across videotaped activities
  - Scored data sheet of videotaped activities

- Trainer will score with the Fidelity Rating System and provide feedback within one month of receiving the materials. Trainer will provide feedback that guides trainee to demonstrate at a minimum a score of "10" on paperwork and 80% fidelity across all videotaped activities.
- These materials are to be sent within two months of receipt of Practice Child feedback. Trainer must pass without Trainer feedback in first submission to continue the program. Please contact the ESDM Training Coordinator\*\* with questions well prior to the submission deadline. **Materials sent after the submission deadline will not be accepted.**

*The submission will be evaluated according to the: (1) developmental appropriateness of Curriculum scoring, selected objectives, and progression of teaching steps, and; (2) accuracy of fidelity and data scoring from videotaped samples.*

#### **Step 5: Submit Second Official Submission**

- Complete Step Five with a new child. Same submission requirements apply here with the exception that additional video may not be needed if fidelity standard was met from practice case video.
- Trainer will score with the Fidelity Rating System and provide feedback within one month of receiving the materials. Trainee will demonstrate a minimum score of "10" on paperwork and 80% fidelity across all videotaped activities. Information will be shared on whether certification in the ESDM direct delivery phase has been met.
- These materials are to be sent within five months of receipt of Practice Child feedback. Trainee must pass without Trainer feedback in first submission to receive certification. Please contact the ESDM Training Coordinator at [esdmtraining@ucdmc.ucdavis.edu](mailto:esdmtraining@ucdmc.ucdavis.edu) with questions well prior to the submission deadline. **Materials sent after the submission deadline will not be accepted.**

*The submission will be evaluated according to the: (1) Developmental appropriateness of Curriculum scoring, selected objectives, and progression of teaching steps, and (2) accuracy of fidelity and data scoring from videotaped samples.*



## Appendix F – Overview of Tier one Training ‘One of the Kids’

### ‘One of the Kids’

Author: Elizabeth Aylward

*Using the Early Start Denver Model (ESDM) to provide a helpful framework of strategies for understanding, engaging and guiding the behaviour of young children with ASD in mainstream Early Childhood Education and Care settings.*

The ESDM is a Naturalistic Behavioural Developmental Intervention (NBDI) model for young children with autism with a strong and growing evidence base. It is heavily embedded in play and based around the child’s daily routines. It is a manualised program, which aims to reduce the severity of autism symptoms, while accelerating the child’s developmental rates in all areas, with particular emphasis in the areas of cognition, social-emotional, imitation and language.

#### A Professional Development package for Early Childhood Education and Care Educators

INTENSIVE WORKSHOP	BOOSTER COACHING	FOLLOW UP GUIDED PRACTICE	EVALUATION
<p>A three-day face-to-face workshop delivered by Certified ESDM Therapist and Trainer. This workshop balances the theoretical background of an evidence-based early intervention with its practical application. Participants work directly with a child with ASD to apply the curriculum and teaching principles of the ESDM with clinical guidance.</p>	<p>Three five-hour follow-up Booster coaching sessions are provided to each group of participants in the 3 preschool closedowns (April, July, October). These sessions are invaluable in terms of consolidating learning and reflection derived from the Intensive Workshop with face-to-face coaching and support from the trainers. It also serves to prevent any drift from the model.</p>	<p>Certified Therapists then provide weekly two-hour sessions of in-service guided practice to same participants while they are on the job. This occurs over a 12-month period, following the Intensive Workshop. Certified Therapists take short video clips of each practitioner implementing the ESDM Teaching principles in their workplace and code these against fidelity criteria.</p>	<p>Qualitative interview based on process evaluation criteria, combined with quantitative measures of practitioner fidelity will form the framework for evaluation of this Professional Development package. Ongoing review occurs through a reflective tool used by every educator – the Educator Self-Monitoring Checklist and ESDM Fidelity tool.</p>

**Appendix G – Curriculum Checklist – Adapted from Rogers & Dawson (2010)**

**The Early Start Denver Model Curriculum Checklist and Item Descriptors**

<b>Name:</b>	<b>Date of Birth:</b>	<b>Date of Assessment:</b>
<b>Parents Interviewed:</b>		<b>Others Interviewed:</b>
<b>Assessor:</b>		



LEVEL 1							
Skill	Receptive Communication	Parent	Entry	Q2	Q3	Q4	Description
Date:							
1	Localises to sounds by turning toward sound source.						Demonstrates awareness of sound by turning eyes and head.
2	Looks to playful vocal sounds (raspberry, whistle).						Demonstrates awareness of sound by becoming more active, turning eyes and head, and looking at person.
3	Responds to voice by turning toward person.						Demonstrates awareness of voice by turning eyes and head and looking at person.
4	Looks at indicated pictures as adult points to pictures in book.						Follows adult point to picture with gaze and/or gesture (e.g. touching picture).
5	Follow a proximal point to place objects in containers, puzzle pieces, etc.						Responds to proximal point by looking and placing object in indicated location.
6	Looks when shown an object and told "Name, look".						Turns eyes and head in direction of object.
7	Looks to partner when name is called.						Turns eyes and head towards partner's body.
8	Follows a proximal point to object or location.						Responds to proximal point by turning head in direction of object or location.
9	Follows distal point to retrieve toy.						Responds to distal point by approaching and picking up the toy.
10	Looks reaches or smiles in response to adult gestures and voice in social games.						Attends and responds for 1 or more rounds. Social games include peek-a-boo, creepy fingers, tickle.
11	Looks, reaches, smiles, and/or gestures in response to adult language/gesture in songs.						Same as above. Attends and responds during songs for 1 or more verses.
12	Responds by stopping actions momentarily in response to inhibitory words (e.g., "no", "stop").						Stops an ongoing activity when told "No, stop" or demonstrates awareness by pausing temporarily, turning eyes and head toward adult, or showing distress (e.g., crying).
13	Gives object as verbally requested when paired with adult's outstretched hand.						Responds to adult gesture or words by placing or attempting to place the object in hand.
14	Performs a one step, routine instruction involving body actions paired with verbal/gesture cue (e.g., "Sit down", "Come here", "Clean up").						Performs action with verbal/ gesture cue. A pass is at least 5 actions at first opportunity. Examples include adult repeating instruction, using gestures to highlight action (e.g., patting chair

							to sit down, holding up bucket to clean up), or physically guiding the child through the action.
15	Performs a one step, routine instruction involving body actions paired with no gesture (e.g., "Sit down", "Come here", "Clean up").						Completes instruction by looking at adult and performing action without adult gestures or physical guidance. Adult may repeat instructions a second time without gesture cue.
<b>Skill</b>	<b>Expressive Communication L1</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Uses a goal-directed reach to request.						Reaches towards desired object in adult's hands to indicate request. Gesture need not be accompanied by eye contact or vocalisations/ words. Does not include reaching just to grab.
2	Vocalises with intent.						Vocalises in conjunction with eye contact and/ or gesture (e.g., reaching) to request desired item or object.
3	"Asks" for help by handing object to adult.						Indicates help by placing object in adult's hand, offering object to adult, verbalising, or looking to adult. Gesture need not be accompanied by eye contact or vocalisations/words.
4	Takes turns vocalizing with communication partner.						Babbles and/or vocalises with eye contact for at least two rounds.
5	Expresses refusal by pushing away object or giving the object back to another person.						Gestures need not be accompanied by eye contact or vocalisations/words. Give credit for other conventional gestures (shaking head, sign "all done") or words ("no").
6	Points proximally to request desired object.						Touches or points to object within 6-12 inches with first or index finger (not open hand) to indicate request. Object may be in adult's hand or in reach of the child.
7	Makes eye contact to obtain a desired object when adult blocks access/ withholds desired object.						Turns head and eyes to adult and makes eye contact for 1-2 seconds with a gesture (e.g., reaching, grabbing) to request object. Eye contact and gesture need not be accompanied by vocalisations/ words.
8	Points to indicate a choice between two objects.						Adult holds up two objects, one in each hand. Touches or points toward desired object with first or index finger (not open hand). Gesture need not be accompanied by eye contact or vocalisations/words.
9	Combines vocalisation and gaze for intentional request						Turns head and eyes to adult and makes eye contact while vocalising to request desired item. Vocalisation may be an approximation. Examples include "aah" for ball or "ooh" for go.
10	Points distally to request desired object.						Uses first or index finger (not open hand) to point toward desired object, 3 feet or more away from child.
11	Points distally to indicate a choice between two objects.						Adult holds up two objects, one in each hand but out of reach of child and shown and names each object to child. Points toward

							desired object that is out of reach with first or index finger (not open hand). Gesture need not be accompanied by eye contact or vocalisations/words.
12	Vocalises with CVCV reduplicative babbling (not necessarily word approximations).						Examples include "ba-ba", "ma-ma". Vocalisation need not be accompanied by eye contact or gesture.
13	Produces 5 or more consonants in spontaneous vocalisations.						Vocalisations occur with or without adult verbal models. Vocal play counts.
14	Produces CVCV with differing CV sequences (variegated babbling).						Examples include "ba-bu", "ma-wa" and strings of jargon.
<b>Skill</b>	<b>Social Skills L1</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Accepts brief sensory social activities and touch.						Child shows no avoidance, withdrawal or negative affect.
2	Uses motor prompt to initiate or continue a sensory social routine.						Examples of motor prompts include reaching, imitating the adult's movement, handing an item or object to adult. Motor prompt need not be accompanied by eye contact.
3	Attends briefly to another person with eye contact.						Attends by looking and sustaining eye contact with another person for 2 seconds.
4	Maintains engagement in sensory social routines for 2 minutes.						Shows interest in sensory social routines by approaching, observing or actively participating and requesting continuation of the routine through eye contact, gestures (e.g., reaching, imitating adult's movements), or vocalisations.
5	Responds to preferred objects/activities via gaze, reach, smiles and movements.						Response need not be accompanied by eye contact.
6	Watches and engages imitative adult during parallel toy play activities.						Shows interest in activity by observing and imitating adult play acts and continues the play schema being imitated.
7	Has a repertoire of 5 - 10 sensory social games.						Participates two or more times in any active behaviour (reach, imitate, vocalise) in a game. Eye contact and smiles alone are not enough. Examples include "Peek-a-boo", rhymes/ songs ("Eensy-Weensy Spider", "If You're Happy and You Know It"), games ("Ring-around-the-Rosy", "Patty-Cake", bubbles, balloons, books, aeroplane, "Here comes a mousey".
8	Responds to greetings by looking, turning, etc.						Demonstrates awareness of greeting by turning head and body and looking at adult for 2-3 seconds. Response need not be accompanied by gesture or vocalisation.
9	Responds to greeting by gesture or vocalisation.						Demonstrates awareness of greeting by turning head and body and waving or vocalising "Hi/Bye" with eye contact for 2-3 seconds.

10	Shares smiles with partner during coordinated play.						Shares smiles with eye contact for 2-3 seconds during play activity with adult.
<b>Skill</b>	<b>Imitation L1</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Imitates 8-10 one step actions on objects.						Imitates eight or more actions on object within 5 seconds of adult's model. Examples include banging two objects together, placing an object in its container, or rolling an object.
2	Imitates 10 visible motor actions inside song/game routines.						Imitates 10 different motor actions within 5 seconds of adult's model. Imitates two different actions per song and four to five different routines to pass. Examples include gestures from songs (e.g., "Give Little Monkeys", "Eensy-Weensy Spider"), motor games (e.g., "Motor Boat", "Ring-around-the-Rosy"), or other play routines (e.g., Peek-a-Boo).
3	Imitates invisible six motor actions on head, face inside song/game routines.						Imitate six different actions that child cannot see him- or herself make. Examples are hands on head, ears, or patting cheeks.
4	Imitates six oral-facial movements.						Imitates oral-facial movement within 5 seconds of adult's model. Examples include wiggling tongue, blowing raspberries, or puffing cheeks.
<b>Skill</b>	<b>Cognition L1</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Matches/sorts identical objects.						May be in response to adult verbal (e.g., "Put here") or physical cue (e.g., hand-over-hand) for first few trials, but child needs to complete matching/sorting independently for at least five different objects. Examples include matching/sorting trains and tracks, crayons and paper, or sticks and circles in separate containers.
2	Matches/sorts identical pictures.						May be in response to adult verbal (e.g., "Put here") or physical cue (e.g., hand-over-hand) for first few trials, but child needs to complete matching/sorting independently for at least five different pictures.
3	Matches/sorts pictures to objects.						May be in response to adult verbal (e.g., "Put here") or physical cue (e.g., hand-over-hand) for first few trials, but child needs to complete matching/sorting independently for at least five different object/picture pairs.
4	Matches/sorts objects by colour.						Match/sort five or more colours. May be in response to adult verbal (e.g., "Put here") or physical cue (e.g., hand-over-hand) for first few trials, but child needs to complete matching/sorting independently. Examples include matching/sorting red versus

							blue blocks, orange versus green pegs, or yellow versus purple balls into separate containers.
Skill	Play L1	Parent	Entry	Q2	Q3	Q4	Description
	Date:						
1	Fits behaviour to the qualities of five different objects.						Action needs to be initiated by child and not in response to adult model. Behaviour fits the affordance of the object. Examples include shaking maraca, banging hammer, rolling or bouncing ball, or stacking blocks.
2	Plays independently and appropriately with 10 one-step toys.						Play is developmentally appropriate (i.e., not restricted or repetitive), relates to the object/activity, and involves one-step actions of objects. Examples include placing blocks in a block sorter, putting balls in a ball maze, placing pegs in holes, or taking apart pop beads.
3	Plays independently with toys requiring repetition of the same action on various objects (ring stacker, nesting cups).						Play involves independent completion of the object/activity. Pass with six or more toys. Examples include placing rings on a ring stacker, taking nesting cups in/out, stacking blocks, or placing pegs in holes.
4	Demonstrates appropriate play behaviours on a variety of one-step toddler toys: throws ball, stacks blocks, mags in holes, rolls car.						Play relates to the object/activity and involves one-step actions of objects. Pass with 8-10 toddler toys. Example toys include throwing balls, rolling cars, or hitting drum.
5	Plays independently with toys requiring two different motor actions (take out, put in).						Play involves independent completion of the object/activity. Pass with 8-10 toys. Examples include taking blocks in/out of container, rolling and smashing play dough, or putting pop beads together and taking apart.
6	Plays independently with toys requiring several different motor actions (e.g., put in, open, remove, close).						Play involves independent completion of the object/activity. Pass with six to eight toys. Examples include opening/closing containers, taking objects in/out, performing different actions with objects.
7	Demonstrates conventional actions on self with a range of objects.						Actions are socially conventional and directed toward self. May be in response to adult model but independent, spontaneous use is necessary for at least one action. Examples include placing phone to ear, brushing hair with hairbrush/comb, putting spoon/fork to mouth, wiping nose with a tissue, cup to lips, put beads on.
8	Completes play task and puts away.						Appropriately finishes activity and shows some attempt to clean up (e.g., puts an object in container, hands materials to adult). May be in response to adult verbal or gesture cue to start routine but needs to participate without physical prompts.
Skill	Fine Motor L1	Parent	Entry	Q2	Q3	Q4	Description
	Date:						

1	Places one to two shapes in a shape sorter.						May be in response to adult cue to start routine but needs to place one to two shapes independently.
2	Places ring on a ring stacker.						May be in response to adult cue to start routine but places three or more rings independently.
3	Completes three-piece wooden handle puzzle.						May be in response to adult cue to start routine but places three or more pieces independently.
4	Puts pegs in a pegboard.						May be in response to adult cue to start routine but places three or more pegs independently.
5	Pushes buttons on five different types of cause-effect toys.						May be in response to adult cue to start routine but needs to push buttons independently.
6	Takes apart pop beads, Duplos.						May be in response to adult cue to start routine but needs to take apart 3 or more beads or Duplos independently.
7	Uses a pincer grasp and a three-finger grasp as appropriate to toy.						Adult may place toys in child's reach but no other facilitation.
8	Stacks three big blocks in a tower (or stacking cups).						May be in response to adult cue to start routine but needs to stack at least three blocks/cups independently.
9	Makes marks, lines, scribbles, and dots with markers/crayons.						May be in response to adult cue to start routine but needs to hold and make marks independently. Marks need not be a recognisable form.
10	Bangs a toy hammer with balls, pegs, etc.						May be in response to adult cue to start routine but needs to hold and bang toy independently.
11	Scoops, rakes, pours with sand, water, rice, etc.						May be in response to adult cue to start routine but needs to hold object and scoop/rake/pour independently.
12	Stacks big Legos.						May be in response to adult cue to start routine but needs to stack at least three Legos independently.
<b>Skill</b>	<b>Gross Motor L1</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Kicks big ball.						May not hold onto adult or object (table, chair) to kick ball. Maintains balance; does not fall; may be clumsy.
2	Walks up and down stairs with support; nonalternating feet.						May hold railing or adult's hand, putting both feet on each step. May not put hands or knees on steps.
3	Climbs one to two steps up small ladder to slide.						Must do so unassisted.
4	Gets on and off pieces of equipment.						Must do so unassisted. Examples include riding toy, rocking horse, child or adult-sized chairs.
5	Protects self when off balance.						Uses protective reactions or equilibrium reactions (e.g., puts hands out, reaches out, protects head).
6	Walks around objects on floor rather than stepping on them.						Shows awareness of body in relation to objects by stepping over or walking around objects.

7	Throws ball and beanbags any direction.						Must do so unassisted and with forward thrust.
8	Rolls ball back and forth with another person.						Adult may start the routine but child shows interest by rolling ball in direction of person.
<b>Skill</b>	<b>Behaviour L1</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Exhibits minimal severe behavioural difficulties.						Examples include self-injurious behaviour, aggression, frequent and/or severe tantrums.
2	Sits in a chair or facing adult during pleasurable activities without difficulty for 1-2 minutes.						Sits calmly/happily for at least 60 seconds while interacting with adult.
3	Willingly engages in simple games in chair and on floor with adult for 5 minutes.						Games may include "Peek-a-Boo", song, or physical routine (e.g., tickle, up/down on adult's lap).
4	Tolerates adult proximity and interaction (minimal demands) without problem behaviours for 20-minute intervals.						Adult's requests are within child's current set of skills. Fussing may occur but no aggressive behaviour.
5	Interacts appropriately with family members (i.e., no aggression or other inappropriate interactions).						No aggression or other inappropriate interactions observed by parent report.
<b>Skill</b>	<b>Personal Independence: Eating L1</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Eats meals and snacks at the table.						Sits at the table throughout a meal (i.e., does not get up or walk to and from table during child's meal; does not need to sit throughout family meal).
2	Eats meal independently.						Adult sets out food but no other assistance is needed.
3	Uses an open cup.						Holds and places cup to mouth without assistance. Some spilling while drinking may occur.
4	Uses a spoon.						Holds and puts spoon to mouth without assistance for most bites. Occasional spilling may occur.
5	Uses a fork.						Holds and puts fork to mouth without assistance for most bites. Occasional spilling may occur.
6	Eats a variety of food textures, types, and food groups.						Parent report is sufficient.
7	Tolerates new foods on plate.						Allows new food to stay on plate and may attempt to eat it (e.g., touches, smells, or places to mouth). Does not have to eat it.
8	Drinks from straw.						Adult may place straw to child's mouth if never given.
<b>Skill</b>	<b>Personal Independence: Dressing L1</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						

9	Removes each piece of clothing with assistance.						Does not need to unbutton or unzip clothing but can take off items (e.g., shirt, pants, shoes, socks) with assistance. Examples include adult helping child pull arms out of shirt and child pulls shirt off head, adult unties shoes and child pulls off foot, or adult unzips pants and child pulls down to feet.
10	Pulls on each piece of clothing with assistance.						Does not need to button or zip clothing but can pull on item (e.g., shirt, pants, shoes, socks) with assistance. Examples include adult rolling up shirt and child pulling head through shirt, adult holding shoe and child stepping into shoe, or adult helps child step into pants and child pulling up pants.
<b>Skill</b>	<b>Personal Independence: Grooming L1</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	Date:						
11	Puts hands under running water.						May be cued if necessary but is able to place hands under water for at least 5 seconds. Parent report is sufficient.
12	Dries hands on towel.						May be cued if necessary but uses towel to dry both hands. Parent report is sufficient.
13	Rubs washcloth on body, towel on body.						May be cued if necessary but uses washcloth/towel on most body parts (e.g., face, hands, stomach, legs). Parent report is sufficient.
14	Tolerates hair combing, nose wiping, and tooth brushing.						May fuss but adult is able to complete routine without aggressive, self-injurious, or severe behaviour problems.
15	Helps with hairbrush/comb.						Examples include holding hairbrush/comb, or taking a turn to brush/comb hair.
16	Puts toothbrush in mouth.						Places toothbrush in mouth, takes toothpaste. Does not have to brush teeth.
<b>Skill</b>	<b>Personal Independence: Chores L1</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	Date:						
17	Puts dirty clothes in hamper.						May be reminded or physically cued (e.g., adult hands clothes, points to hamper) if necessary, but is able to drop clothes in hamper.
18	Puts tissues in trash.						May be reminded or physically cued (e.g., adult hands tissues, points to trash) if necessary, but is able to drop tissues in trash.



## The Early Start Denver Model Curriculum Checklist and Item Descriptors

<b>Name:</b>	<b>Date of Birth:</b>	<b>Date of Assessment:</b>
<b>Parents Interviewed:</b>		<b>Others Interviewed:</b>
<b>Assessor:</b>		

## Level 2

Skill	Receptive Communication L2	Parent	Entry	Q2	Q3	Q4	Description
	<b>Date:</b>						
1	Follows instructions to “stop” or “wait” without prompts or gestures.						Child responds to verbal instruction alone; stops activity completely, looks to adult, and waits for adult instruction.
2	Follows 8–10 one-step verbal instructions involving body actions and actions on objects.						Child responds to verbal instructions involving verbs (e.g., shake maraca, bang sticks, hug baby, poke dough, cut, stand up, clap hands, wiggle ears; has to follow both types – body actions and actions on objects).
3	Identifies by pointing or showing several named body parts on self or other person.						Pass requires identification of five or more body parts.
4	Responds to verbal instruction to give/point/show for 8–10 specific objects in natural play, dressing, eating routines (e.g., baby, chair, car, block, cup, bear).						Self-explanatory.
5	Identifies by pointing and visually attends to three named pictures in a book (including cup, car, dog, cat, baby).						Responds to “Where is ...?” or “Show me...” with index finger point and look.
6	Understands early spatial concepts (e.g., in, on).						Pass requires that the child demonstrates generalised understanding of three or more prepositions by following verbal instructions using objects.
7	Looks to people and photos of people when named – family, pets, teachers.						Pass involves responses to four or more different names. If the named person/ pet is present, child clearly looks at the person or pet when named (may also point). If pictures, child touches or points to picture when named.
8	Retrieves 8–10 verbally requested objects in room but not directly in front of child, requiring some search.						In response to the verbal question “Get the ...”, child retrieves objects in room but out of line of sight. The task involves remembering request long enough to conduct a visual search of the room, retrieving the object from floor, table, chair, or shelf.
9	Upon verbal request (with gesture cues), completes 2 actions with one object.						Child sequences two actions together on an object in response to verbal instruction with gesture. Must demonstrate three or more different sequences to pass (e.g., “Get your shoes and bring them to me”).

10	Points to named body parts in picture.						Identifies five or more body parts in a large photo or line drawing when asked.
<b>Skill</b>	<b>Expressive Communication L2</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Uses target signs or gestures with vocalisations to express (request, all done, help, protest).						Child combines specific gesture and vocalisation or word approximation to communicate all four of these functions.
2	Produces 6-10 single words or approximations within the context of familiar routines, sensory-social routines, songs.						Produces five or more differentiated word approximations inside familiar social routines. These can be spontaneous or spontaneously imitated but not prompted.
3	Spontaneously produces multiple words associated with a play routine (roll, stop, go).						Produces three or more differentiated word approximations for verbs involving actions on self or objects – spontaneous or imitated but not prompted.
4	Functional use of 20 or more approximations of nominals (names of objects, animals, people) and nonnominals (words that refer to actions or other relations: all gone, up, etc).						These involve word approximations used spontaneously to request actions or objects. Both nouns and nonnominals must be used to pass.
5	Spontaneously labels objects and pictures.						Pass if child labels five or more objects and five or more pictures spontaneously.
6	Vocalises with varied intonation during songs, etc.						Child varies intonation as he or she produces some words to songs or chants, demonstrating awareness of the intonation patterns involved.
7	Requests and refuses using single words with gaze.						Child routinely uses single words with gaze to convey both requesting and protest, refusal or negation.
8	Labels actions in context (e.g., during body movements and/or actions on objects).						Child produces 10 or more verbs both imitatively and spontaneously to label actions on self, other, or objects.
9	Approximates names of three important people (includes self).						Child uses names to label people in pictures, mirror and real life. Can be in response to question "Who is that?"
10	Shakes head and says "no" to refuse.						Child spontaneously combines head shake with word "no" to refuse an offer.
11	Nods head "yes" and says "yes" to affirm.						Child spontaneously combines head nod with the word "yes" to accept an offer.
12	Asks (approximates) "What's that?" when encountering something unfamiliar.						Child spontaneously looks to adult and gestures to object via manual gesture or gaze shift while asking "What's that?" in several different contexts.
<b>Skill</b>	<b>Joint Attention behaviours L2</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						

1	Responds to "Look" and offered object with gaze shift, body turn, and looks at offered object.						Self-explanatory.
2	Responds to "Look" and point by orienting to the indicated distal object/person.						Self-explanatory.
3	Gives or takes object from other person, coordinated with eye contact.						Self-explanatory.
4	Responds to "Show me" by extending object to adult.						Self-explanatory.
5	Spontaneously "shows" objects.						This involves routine acts of showing – positioning the toy toward the adult's face, looking to the adult, and waiting for a comment. Pass if this is seen several times in an hour of play.
6	Spontaneously follows point or gaze (no verbal cue) to look at target.						Get child's gaze in face-to-face interaction, and then turn to look at object. Pass if child shows head turn and some search. Does not need to find the target.
7	Spontaneously points to interesting objects.						This involves routine acts – several per hour. Child must point to target and look to adult and wait for comment to pass.
8	Shares smile with adult when alternating gaze during pleasurable object activity.						This involves clear gaze shifts from object to adult eyes and back to object to share pleasure. Should be seen several times in a 10-minute period of social play to pass.
<b>Skill</b>	<b>Social Skills: Adult or Peers L2</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Initiates and maintains eye contact for communication.						Child routinely begins communicative exchanges (of any type) with gaze and maintains gaze in natural way throughout the exchange.
2	Verbally requests or physically initiates familiar social games.						Child initiates and cues social gaze through body movements, gestures or vocal patterns that are specific to a certain game. Must cue three or more games to pass.
3	Returns affection behaviours: hugs, kisses to familiar others.						Child spontaneously and consistently hugs back to familiar adults with arms and body, kisses back with pucker on cheek or lips.
4	Uses gesture or words to attain adult's attention.						Child seeks adult eye contact using either words or clear gestures of any type (wave, show, turn face, pat, etc).
5	Responds to social greeting with "Hi" or "Bye-bye", and waves imitatively.						Child responds to greetings with both words and gestures, without prompting.
6	Asks for help verbally or gesturally.						Child initiates requests for help using either conventional signs or word approximations combined with gaze. Manipulating hands and bodies does not count unless accompanied by both gaze and appropriate words.

7	Consistently coordinates eye contact with vocalisation and/or gesture to direct communication.						Child consistently accompanies spontaneous communicative acts with eye gaze.
8	"Dances" with another in circle games to music.						Child plays several different circle games and imitates dance movements to music ("Hokey Pokey", "Ring-around-the-Rosy", "London Bridge").
9	Runs with another in "chase" game.						Child chases another person and catches them while playing "chase", and also runs to be caught, during "chase".
10	Gains communication partner's attention using name of person or game and initiates social game or activity.						Child spontaneously initiates familiar social games toward a partner by establishing eye contact and using an associated gesture and their name or an action word (e.g., "tickles", "chase").
<b>Skill</b>	<b>Social Skills with Peers L2</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
11	Gives objects to peer when peer requests.						Child consistently responds to peer verbal request for an object by looking and handing it to peer.
12	Joins in with familiar songs/finger plays in a group setting.						Child participates in familiar songs and social games with appropriate movement patterns in small group setting (1-2 other children) without any special cuing.
13	Continues with activity when peer joins in parallel play.						Child continues activity when peer joins, acknowledging and accepting peer approach. Child does not "protect" materials or reject approach.
14	Responds appropriately to peer's greetings.						Child spontaneously responds to "Hi" and "Bye" from a peer with look, gesture, and appropriate words.
15	Takes turns with peer with simple action toys when peer requests; gives and takes back.						In a parallel play situation, child routinely responds to peer bids for a turn-taking exchange by both giving object when requested and asking for a turn either verbally or nonverbally, both accompanied by some gaze.
16	Sits in group with peers and attends to adult's familiar instructions.						Child sits in a small group without special seating or adult assistance, attends to lead adult, and follows verbal instructions that are within the child's repertoire. Adult may use child name to deliver instruction but no other prompting.
17	Takes object from peer when peer offers.						Child routinely takes object with eye contact when a peer offers it.
18	Passes objects to peers at table or in group when requested.						Child consistently responds appropriately to object requests in small-group situations (e.g., circle time, snack time, art table, dramatic play corner).
19	Imitates peer's behaviour occasionally in play activities.						During parallel play activities, child will imitate a few peer actions spontaneously.

20	Plays picture-matching games (Memory, Lotto, etc.) alone and with peer.						Pass if child can take turns with partner and complete the match. These are the only skills needed to pass this item.
<b>Skill</b>	<b>Imitation L2</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Imitates a variety of vowel and consonant sounds during verbal approximations in meaningful communications.						Includes four to five different vowel sounds and four to five different consonant sounds.
2	Imitates animal sounds and other sounds.						Imitates at least five different sounds.
3	Imitates recognisable single words spontaneously frequently in interactions.						Produces 10 or more word approximations.
4	Imitates motions to five songs; imitates at least 10 different actions.						These are familiar actions; no prompts.
5	Imitates/approximates novel actions in songs.						Approximates at least five novel actions at first model.
6	Imitates actions on objects – multiple steps (play actions).						This involves imitating a sequence of three or more related actions (e.g., taking off the shape sorter cover, taking out the shapes, putting the lid on and putting the shapes through).
7	Imitates pretend play acts to self and partner with miniatures.						Child consistently imitates four or more naturalistic actions with miniatures, on self and also offered to partner.
8	Imitates two movement sequences in song/game routines.						Child spontaneously imitates two or more actions within a single song without any prompting or waiting.
9	Imitates two-word phrases.						Child routinely imitates a variety of two-word utterances.
<b>Skill</b>	<b>Cognition L2</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Matches/sorts by shapes.						Matches and sorts at least five different shapes.
2	Matches/sorts by size.						Matches and sorts to at least three different sizes of identical objects.
3	Matches/sorts designs, line drawings.						Child matches and sorts line drawings and design patterns.
4	Sorts similar objects into like groups.						Child matches and sorts non-identical objects by identity (e.g., cars, horses, balls, socks, shoes, cups).
5	Sorts related common objects into functional groups.						Child groups objects by function: eating, clothes, toys, drawing.
6	Searches/requests for missing object.						Child recognises when one object out of a set is missing and asks for it or searches for it (e.g., a missing puzzle piece, a missing shoe, a missing cup) .

7	Matches/sorts in two dimensions.						Child matches/sorts objects by colour and shape, or shape and size, etc.
8	Matches by quantities one through three.						Matches a variety of objects in quantity groups involving the quantities one to three (e.g., domino pieces, animal crackers on a plate).
<b>Skill</b>	<b>Play: Representational L2</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Combines related objects in play (cup on saucer, spoon in dish).						Child demonstrates awareness of functional relations of multiple sets of objects in his or her play and in clean-up.
2	Imitates/produces sound effects with play (vocalises on phone, makes car noises, animal sounds with animals).						Pass if child makes five or more such sounds in play.
3	Carries out single action with a prop on a doll or animal.						Requires spontaneous action; do not pass for imitation only.
4	Combines functionally related actions on a play theme (feeds and gives drink, puts to bed and covers up).						Requires spontaneous actions involving at least two related acts in a row. Do not pass for imitation only.
5	Demonstrates a trial and error approach to problem solving with constructive toys; schemas are flexible, not repetitive.						Pass if child routinely demonstrates trial and error problem solving in object play.
<b>Skill</b>	<b>Play: Independent L2</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
6	Plays appropriately and flexibly for 10 minutes with only occasional adult attention.						Adult can lay out several sets of constructive or visual spatial materials, but the child needs to play alone using mostly appropriate play acts, without more than two verbal interactions, to pass this item. Do not penalise if some repetitive or stereotypic acts occur within the appropriate play.
7	Can occupy self appropriately with open-ended materials for at least 10 minutes at a time with occasional adult guidance.						Adult can lay out the material (play dough, art, books pretend play props), but the child needs to play alone using mostly appropriate play acts, without more than two verbal interactions, to pass this item. Do not penalise if some repetitive or stereotypic acts occur within the appropriate play.
8	Gets materials, brings to table, completes play task, and puts away.						Child plays independently including getting the materials, moving into a space for play, and cleaning up and putting away at the end. This can involve open-ended or closed-ended activities.
<b>Skill</b>	<b>Fine Motor L2</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						

1	Puts three or more shapes in shape sorter accurately.						Child completes the shape sorter independently; may use trial and error but no prompts or supports of any type.
2	Stacks 8-10 1-inch blocks.						The child independently builds a block tower of 8 – 10 blocks that balances.
3	Copies three or more simple block designs.						The child copies several different arrangements involving at least three blocks (e.g., vertical tower, horizontal line, bridge).
4	Puts together five or more Duplos, pop beads, tinker toys, bristle blocks in varied ways.						Child uses multiple types of interlocking objects and assembles five or more pieces in several ways.
5	Imitates five or more simple actions on play dough (roll, poke, pat, squeeze).						Self-explanatory.
6	Puts multiple stickers on sheets.						The adult may have to peel a corner up so the child can grasp, but the child takes the sticker off the sheet and places it on a sheet of paper independently.
7	Opens and closes a variety of containers, including screw-on lids.						This is not a test of strength – the tops should be easy to remove.
8	Zips and unzips large zipper.						Child can independently unzip a zipper all the way down; the child can pull a zipper all the way up, though an adult will have to connect the two pieces for the child.
9	Strings large objects with thick string, or aquarium tubing.						The child strings five or more beads, pieces of pasta, rings etc. onto a fat string without help or prompts.
10	Imitates strokes, scribbles and dots with marker, crayon.						The child imitates at least three different types of actions with writing tools.
11	Snips paper with scissors.						The snip need not cut off a piece of paper. May use children's or adults' scissors. Adult may show how to hold scissors but child cuts independently. Does not need to hold scissors perfectly. Must make three snips.
12	Places checkers and pennies in a slot.						The child independently picks up five or more pieces from the table and places it into a slot, both horizontal and vertical, without prompts or reminders, and is successful with pennies.
13	Strings a variety of beads on different types of string.						Child can string multiple objects onto various types of cords.
14	Completes four- to six-piece single-inset puzzles.						Child completes the puzzle independently; may use trial and error but no prompts or supports.
<b>Skill</b>	<b>Gross Motor L2</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Imitates gross motor actions in a variety of positions (sitting, standing, moving).						Child consistently and spontaneously imitates gross motor actions (can be instructed) regardless of location. These can be



							approximations; it is the consistency, not the precision, that is important.
2	Jumps off step and over obstacles.						Child jumps and moves forward in space, from a low step to the ground, as well as from the ground.
3	Uses some equipment on playground (climbs, slides).						Child consistently initiates multiple appropriate actions on several pieces of low playground equipment.
4	Sits on tricycle and pushes with feet or begins to pedal.						Child independently places self on tricycle in correct position for riding and tries to pedal but may need assistance to do so.
5	Pulls wagon or pushes wheelbarrow.						Child independently operates wagon or wheelbarrow to move things on the playground.
6	Kicks ball into target.						Child kicks large ball with directionality.
7	Digs with shovel.						Child digs with shovel, scoops up material, and deposits in container independently, multiple scoops.
<b>Skill</b>	<b>Personal Independence: Eating L2</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Uses a napkin when cued.						When instructed but without further assistance, child picks up napkin and wipes the appropriate body part as per instruction. Does not have to be thorough but has to be more than cursory.
2	Serves self food from bowl with utensil.						When adult holds or positions serving bowl or plate for child, child uses the serving utensil to move food to child's plate independently. May be clumsy. Adult may cue amounts.
3	Passes containers when instructed.						At the table, when another person asks child to pass an item, child looks for item, picks it up and passes it to the person on left or right. Child must respond to the request by searching for the object and trying to pick it up independently. If someone passes a container to the child and instructs child to pass to the next person, child follows instructions without prompts.
4	Carries plate, cup and silverware to sink or counter when finished.						When child leaves table, child follows adult instructions to take specified items to specified location without prompts.
5	Stays at table with companion for duration of child's meal.						Child sits throughout meal and stays in seat without prompts or other supports until child is finished eating and adult indicates child may go.
6	Eats and behaves appropriately at fast food restaurants.						Child participates in all steps of fast food meal – waiting, ordering, carrying, sitting, eating, clean-up and exit, without needing full physical prompts. Child sits until finished and until adult ends meal. Child willingly walks with adult to door and table. Does not need to have hand held to stay with adult.

7	Will touch or taste a new food that has been introduced multiple times.						Child will respond willingly to instruction to taste or take a bite or a drink of a familiar food.
8	Eats from all food groups.						Child eats some items from fruits/vegetables, dairy, grains and meats (unless there are familial restrictions) spontaneously.
9	Gets drink of water independently.						Child spontaneously gets glass and gets water from sink or fridge door without any instructions or help from adult. If sink is used, child turns off water spontaneously.
<b>Skill</b>	<b>Personal Independence: Dressing L2</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
10	Removes all clothing independently and puts in hamper (no fasteners).						When instructed, child removes shirt, pants, underwear, socks and shoes without help other than fasteners and places all clothes in appropriate container. Child may be verbally or gesturally reminded once or twice throughout routine but without physical prompts, either full or partial.
11	Completes some steps of putting on each piece of clothing independently (needs help with fasteners).						Self-explanatory.
12	Takes off jacket, hat (no fasteners) and puts on hook.						Takes off loose jacket and hat independently; may be prompted to place on hook.
<b>Skill</b>	<b>Personal Independence: Hygiene L2</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
13	Wipes face with warm cloth when instructed.						After adult provides damp washcloth and instruction to "Wash your face", child rubs the entire surface of face without further help and gives cloth back or sets it down when finished.
14	Wipes nose when instructed.						When instructed to blow or wipe nose, child routinely goes to tissue box, gets tissue, blows or wipes nose and throws tissue away with no more than one verbal, and no manual, prompts.
15	Participates in all steps of hand washing.						Child routinely carries out manual action for each step of hand washing other than turning water on without needing full physical prompts. Adult may prompt through gesture or partial physical prompt.
16	Cooperates with hair washing/cutting.						Child does not fight, cry, or otherwise protest during hair washing or cutting. Child participates by helping rub shampoo, towel. May use strong reinforcers during routine.
17	Plays with five bath toys appropriately.						Self-explanatory – for conventional bath toys.
18	Puts toys away when requested at end of bath.						Child must routinely put all bath toys in proper container without further prompts after initial instruction to pass.

19	Helps with lotion.						Child assists parent in rubbing lotion on hands, arms, legs, belly.
20	Brushes toothbrush over teeth.						Child rubs toothbrush over lower teeth and upper teeth, front and back when instructed. All prompt levels other than full physical prompts can be used.
21	Goes to sleep independently after bedtime ritual.						Child routinely sleeps in own bed and goes to sleep without an adult present in the room after the bedtime routine ends and lights are turned out. Child seldom gets out of bed and comes out of room after being put to bed.
22	Shows knowledge of sequence of bedtime routine.						Child demonstrates awareness of bedtime routine by initiating one or more activities, and participating in various steps of routine without need for full prompts.
<b>Skill</b>	<b>Personal independence: Chores L2</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
23	Sorts silverware from dishwasher tray to silverware tray.						Adult may set up the situation, but after the set up and initial instruction, child takes as many as 20 utensils from dishwasher container and places them in silverware tray without any adult help.
24	Unloads dryer into basket.						When parent opens dryer door and provides basket, child will pull all items out of dryer into basket without need for further prompts. Child may need some help with a difficult item.
25	Matches socks.						Working from a group of 10 or more socks in pairs, folds or clips them, and stacks them in a container.
26	Pour water/food into pet dish.						Adult may provide materials and direct instruction, but child carries out the act without further help.

## The Early Start Denver Model Curriculum Checklist and Item Descriptors

<b>Name:</b>	<b>Date of Birth:</b>	<b>Date of Assessment:</b>
<b>Parents Interviewed:</b>		<b>Others Interviewed:</b>
<b>Assessor:</b>		

**LEVEL 3**

Skill	Receptive Communication L3	Parent	Entry	Q2	Q3	Q4	Description
	<b>Date:</b>						
1	Attends and joins in with interest for 5-10 minutes as adult reads familiar books using simple sentences.						Stays with adult, pays full attention, and participates in a story the adult is reading. Examples include alternating eye contact between book pages and adult, pointing to pictures in book, turning book pages, vocalising the names of pictures in a book.
2	Follows one-step novel commands involving familiar objects/actions.						Completes instruction by looking at adult and performing action without adult gestures or physical guidance. Adult may repeat instructions a second time without gesture cue.
3	Identifies many common objects and their pictures: clothing items, objects related to meals, hygiene, play, foods.						Identifies 50 or more common objects to pass.
4	Responds appropriately to "yes/no" questions regarding preferences.						Uses "yes/no" in the appropriate requesting and refusal contexts. Must include eye contact, though need not be accompanied by gestures (i.e., nodding/shaking head). May use politeness phrases: "yes, please", "no, thanks".
5	Identifies 5 or more actions in pictures and books.						Vocalises and/or gestures (e.g., points) in response to adult's questions. Examples are "Show me the baby sleeping?" or "Do you see the dog running?" Response need not be accompanied by eye contact.
6	Follows two or more instructions given in situational routines (bedtime: get a book and get in bed; tooth brushing: get your toothbrush and the toothpaste).						Routinely follows two- to three-part routine instructions involving actions and objects in well-practiced routines.
7	Understands spatial relationships involving objects (e.g., under, next to).						Examples are using concepts appropriately when asked ("Put the ball next to the car" or "Put the ball under the table")
8	Differentiates early size concepts – big/little.						Vocalises or gestures (e.g., points, hands object) in response to adult's questions. Examples are "Where is the big ball?" or "Show me the little car". Response need not be accompanied by eye contact.
9	Differentiates at least four different colours upon request.						Vocalises or gestures (e.g., points, hands object) in response to adult's request. Examples are "Which is the blue crayon?" or

							"Show me the red truck". Response need not be accompanied by eye contact.
10	Identifies 20 items by sound (e.g., animals, telephone, "What animal says 'meow meow?")						Vocalises or gestures (e.g., points, hands object) in response to adult's question. Examples are "What animal says 'meow meow'", "What does the doggie say?", or "What do you hear?" Response need not be accompanied by eye contact.
11	Comprehends the function of common objects (ride, cut, eat, sleep, put on feet, drink, etc.)						Vocalises or gestures (e.g., points, hands object) in response to adult's question. Examples are "What do we ride in?" or "What do we use to take a drink?" Response need not be accompanied by eye contact. Identifies three or more object functions to pass.
12	Understands pronoun referents "mine" and "yours".						Vocalises or gestures (e.g., points, hands object) in response to adult's question. Adult may use an object belonging to child to probe understanding. Examples are "Whose turn is it?" or "Whose shoe is this?" Response need not be accompanied by eye contact.
13	Identifies 10 actions via pictures, choices, acting out.						Vocalises or gestures (e.g., points, hands picture, acts out) in response to adult's question. Examples are "Show me how you throw a ball" or "Show me the pig eating".
14	Follows two or more unrelated instructions in novel context.						Completes instruction by looking at adults and performing action without adult gestures or physical guidance. Adult may repeat instructions a second time without gesture cue. Examples are "Give me the car and close the book" or "Put the ball in the bucket, and put the doll on the table".
<b>Skill</b>	<b>Expressive Communication L3</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Produces two- to three-word combinations for a variety of communicative intentions (e.g., requesting, greeting, gaining attention, protesting).						Verbalisations must include eye contact. Examples are "Want more juice", "Bye, Sally", "Help me open" or "No ball". Articulation need not be perfect.
2	Produces two or more word utterances to comment to another person.						Verbalisations must include eye contact and are not related to requests to comment on objects or actions. Examples are "See cow", "Airplane go fast" or "Doggie". Articulation need not be perfect.
3	Labels actions in pictures and books.						Verbalisations need not be accompanied by eye contact. Examples are "Baby eating" or "Bird flying". Articulation need not be perfect.
4	Comments and requests on location (up, down, in, on top).						Verbalisations must include eye contact. Examples are "Bunny on chair" or "Ball in da (there)". Articulation need not be perfect.
5	Comments and requests using early possessive forms (mine, yours).						Verbalisations must include eye contact. Adult may use an object belonging to child. Examples are "That's (sippy cup) mine", "Your turn" or "My baby". Articulation need not be perfect.

6	Gestures or vocalises "I don't know" in context.						Verbalisation or gesture (e.g., shrugging shoulders, holds up hands) must include eye contact.
7	Consistently uses other people's names to get their attention.						Verbalisation must include eye contact. Articulation need not be perfect.
8	Delivers a simple message to another person ("Go tell Mummy 'Hi'").						Verbalisation must include eye contact. Examples are "Go tell Mummy 'Hi'" or "Go tell Daddy to come here". Articulation need not be perfect.
9	Says "Hi" and "Bye-bye" appropriately, both initiating and in response.						Verbalisation must include eye contact
10	Uses pronouns for self and other (me and you variants).						Verbalisation must include eye contact. Adult may want to use a mirror to probe. Response may include me and you variants. Examples are "That's me" or "I see you".
11	Uses simple words and gestures to describe personal experiences.						Verbalisation and/or gestures (e.g., acting out) must include eye contact. Child may use single words or simple phrases. Examples are "Doggie", "Catch ball" or "Balloon goes up". Articulation need not be perfect.
12	Names one to two colours.						Verbalisation need not be accompanied by eye contact. Adult may ask "What colour is the car?" but child must initiate answer ("red car", "it is a blue balloon"). Approximation may be accepted.
13	Responds appropriately to "What?" questions.						Verbalisation need not be accompanied by eye contact. Adult may ask a second time.
14	Responds appropriately to "Where?" questions.						Verbalisation need not be accompanied by eye contact. Adult may ask a second time.
15	Responds appropriately to "Who?" questions.						Verbalisation need not be accompanied by eye contact. Adult may ask a second time.
16	Asks simple "yes/no" questions using rising intonation (can be one-word utterance with rising intonation).						Verbalisation must include eye contact. Question may be one-word utterance with rising intonation. Examples are "Cookie?" or "Go bye-bye?"
17	Asks "What?" and "Where?" questions.						Verbalisation must include eye contact. Must ask both questions to pass.
18	Answers simple information questions: name, age, colour of shirt, etc.						Verbalisation need not be accompanied by eye contact. Examples are "What's your name?", "How old are you?" or "What colour is your shirt?"
<b>Skill</b>	<b>Social Skills: Adult and Peers L3</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Plays simple gross motor games (e.g., ball, "Hide and Seek", "Ring-around-the-Rosy").						Participates two or more times in any active behavior (reach, imitate, vocalise) in three or more games. Eye-contact and smiles alone are not enough. Examples are "Hide and Seek", "Ring-around-the-Rosy", playing ball.

2	Shares and shows objects when partner requests.						Responds within 3 seconds of partner's request. Partner may repeat a second time. Response may include verbalisation (e.g., "baby") or gesture (e.g., brings object to partner, holds up object in hand).
3	Imitates and carries out novel songs/finger plays in group situation.						Participates two or more times in any active behavior in two or more routines. Eye contact and smiles alone are not enough. Examples are "Creepy Fingers", "Tickle", or "Eensy-Weensy Spider".
4	Responds appropriately to simple requests/instructions from peers.						Parent report may be accepted. Examples are "Get the ball", "You be the mummy" or "Put this there"
5	Initiates interactions and imitations of peers.						Parent report may be accepted. Initiates/imitates two or more rounds in three or more age-appropriate games (e.g., "chase", "Hide and Seek", playing with trains, dress up).
6	Plays in familiar dramatic play routine with peer in parallel play.						Parent report may be accepted. Participates in two or more rounds. Behaviors may include verbalisations (e.g., "Baby's hungry"), imitating, or observing partner's play. Examples of routines are playing house, dress up, role play.
7	Takes turns with simple board games.						Participates in two or more rounds in three or more age-appropriate games. Examples are "Connect Four", "Caribou", or "Lucky Ducks".
8	Uses politeness terms: "Please", "Thank you", "Excuse me".						Examples are "Please", "Thank you", or "Excuse me", spontaneously and appropriately. Approximations may be accepted. Pass if frequently uses two of the three.
9	Imitates a variety of novel gross motor actions in standing and while moving, such as in "Follow the Leader" or animal walks.						Examples are "Follow the Leader", "Simon Says", or pretending to move as animals. Spontaneously imitates 10 or more novel actions. Can be imprecise.
10	Participates in play activities involving verbal scripts.						Participates in three or more activities with active behaviors (verbalises, acts out, imitates). Eye contact and smiles alone are not enough. Examples are playing house, being teacher, or putting baby to bed.
11	Frequently draws other's attention to objects verbally and gesturally to comment, show, share and request.						Initiates behaviors three or more times with eye contact. Examples are verbalisations (e.g., "Mama, look, kitty", "Blocks fall down", or "More crackers, Daddy") with gestures (e.g., gives or holds up object to adult, points to item).
12	Responds to others' bids for joint attention by looking and commenting.						Responds within 3 seconds of adult's bid. Adult may repeat a second time.
13	Receptively identifies affect from photos, in others, and/or in line drawings.						Responds within 3 seconds of adult's bid. Adult may repeat a second time. Identifies two or more affective feelings (e.g.,



							happy, sad, mad, scared, surprised). Verbalisation need not be accompanied by eye contact.
14	Expressively identifies affect from photos, in others, and/or in line drawings.						Identifies two or more affective feelings (e.g., happy, sad, mad, scared, surprised). Response need not be accompanied by eye contact.
15	Makes own face reflect affect (happy, sad, mad, scared).						Reflects two or more affective feelings (e.g., happy, sad, mad, scared, surprised). Response need not be accompanied by eye contact.
<b>Skill</b>	<b>Cognition L3</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Matches letters in own name.						Matches all letters in first name.
2	Matches letters.						Matches five or more letters. May be in response to adult verbal cue (e.g. "Where's A?") or demonstrate first few trials, but child needs to match independently at least five trials.
3	Matches words.						Match/sort five or more words. May be in response to adult verbal cue (e.g., "Where's c-a-t?") or demonstrate first few trials, but child needs to match independently at least five trials.
4	Matches numbers.						Match/sort five or more numbers. May be in response to adult verbal cue (e.g., "Where's 6?") or demonstrate first few trials, but child needs to match independently at least five trials.
5	Receptively and expressively identifies some letters, numbers, shapes, and colours.						Identifies five or more in each category. May be in response to adult verbal cue (e.g., "Where's 6?", "Show me the blue crayon", or "What letter?") or demonstrate first few trials, but child needs to identify independently at least five trials.
6	Plays games involving memory for hidden objects.						Identifies three or more hidden objects. Adult may probe by showing three objects (e.g., penny, small ball, stick) to child and then placing a cup over each item. Adult waits 7 seconds and then shows a second copy of one of the hidden objects (e.g., small ball) and asks "Where's the other ball?" Response may be verbalisation ("There") and/or gesture (e.g., points/picks up cup). Eye contact is not necessary. Adult should set up three or more trials.
7	Categorises objects/pictures into eight classes.						Will sort into sets of three, for up to eight classes.
8	Understands relationship between quantities and number symbols through number 5.						Understands relationship either verbally (e.g., counts out five objects) or gesturally (e.g., touches or groups five objects).

9	Counts correct number of objects to five.						Assigns value up to five or more objects. Adult may have child count preferred objects, such as checkers, candy, trains, or blocks. Adult may count the first item to begin but child needs to continue and end independently.
10	Sequences three or more pictures in correct order and narrates sequence for pictures using "first, then" language.						May be in response to adult verbal cue (e.g., "What's next?"). Child needs to sequence independently and narrate when asked "Tell me about it" for three or more different sequences.
<b>Skill</b>	<b>Play L3</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Constructive play involves sequencing complex schemas with multiple coordinated objects (e.g., trucks on road, blocks make building, beads make a necklace).						Construct three or more schemas. Multiple objects may be trucks on road, blocks make building, beads make a necklace.
2	Link three or more related actions in a play sequence.						Examples are building track, pushing trains, and crashing trains, or taking out play dough, using shape cutter, taking out shape. (Note: These can form the picture sequence for #10 alone).
3	Performs two or more linked actions on a doll or animal when instructed.						Examples are pretending to pour juice and feeding baby, picking up blanket and putting doll to bed, or putting animal in car and pushing car.
4	Physically places figures on miniature furniture, vehicles, etc., when appropriate.						Places figure in appropriate context during play. Examples are seating dad in chair to watch TV or putting mum in car to drive to store.
5	Carries out actions on doll or animal figures spontaneously.						Completes three or more actions without adult prompts.
6	Arranges props for the theme.						Arranges two or more props in three or more different play schemas. Examples are setting out fork and plate to feed baby, putting hat on self and other to play dress ups.
<b>Skill</b>	<b>Fine Motor L3</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Completes five- to six-piece interlocking puzzle.						Self-explanatory.
2	Imitates drawing circle, cross, square, diagonal line.						Imitates each one at least once. Adult models and may use verbal cue (e.g., "Draw this").
3	Imitates and builds different block structures using a variety of building materials (blocks, Legos, Tinker Toys, etc.).						Uses five or more blocks to build three or more different structures. Building materials may be blocks, Legos, Tinker Toys, etc.
4	Laces a running stitch.						Laces through three or more loops/holes. Adult may use verbal cue (e.g., "Put it in there") or demonstrate first trial.

5	Traces lines and curves with finger and writing tool.						Traces at least three-fourths of line and curve with finger and writing tool. Adult may model first trial.
6	Uses a variety of tools to pick up and release objects: tongs, fork.						Uses two or more tools to pick up and release two or more objects. Examples are using a large spoon to pick up/release a piece of food or tongs to pick up/release blocks.
7	Traces a variety of shapes.						Traces three or more shapes (e.g., square, circle, triangle, rectangle). May use plastic frame or trace lines on paper.
8	Uses scissors with appropriate grasp and uses opposite hand to stabilise and turn paper.						The cut need not follow a line but cuts off a strip of paper in two. Adult may show how to hold scissors and cut through paper.
9	Cuts on a line – straight and curved lines.						Cuts along the line fairly accurately. Adult may model first trial.
10	Carries out simple two-step art projects (cut and paste, stamp with ink pad; folds paper and cuts on line).						Adult may use verbal cue (e.g., “First do this, then do this”) or demonstrate steps on first trial. Examples are cut and paste, stamp ink pad and paper, folds paper and cuts on line.
11	Carries out several different schemas with play dough – uses a variety of tools.						Carries out three or more schemas. Uses two or more tools to pass. Examples are rolling dough with pin and cutting with knife to make a snake, or rolling dough into ball and pretending to eat with fork.
<b>Skill</b>	<b>Gross Motor L3</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Rides tricycle well (pedals and steers, follows a route).						Pedals and steers, follows a route independently and with good coordination.
2	Kicks with good form and balance.						Kicks without holding onto object/person. Does not stumble or fall down. Makes contact three or more times.
3	Uses all playground equipment with supports.						Climbs and uses low-play (e.g., swings, small slides, seesaws) and high-play equipment (e.g., jungle gyms, monkey bars, high slides). May hold on to railings.
4	Plays chase game with adults and peers, running smoothly, changing direction with good balance.						Plays for at least 5 minutes
5	Imitates gross motor actions with movement to songs and music.						Imitates five or more actions in three or more different songs. Examples are imitating body movements in “If you’re happy and you know it...” or “The wheels on the bus...” Imitations are spontaneous and immediate.
6	Throws underhand at target.						Throws underhand three or more times. Does not have to hit target perfectly. Adult may demonstrate up to two trials.
7	Jumps forward with two feet together.						Jumps forward three or more times.

8	Hops on one foot.						Hops on one foot at least once. May hop while holding on to another person or stable object, without falling.
<b>Skill</b>	<b>Personal Independence L3</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Uses spoon, fork, and cup neatly and without spilling.						Need not hold spoon or fork correctly.
2	Behaves appropriately at sit-down restaurant.						Family is able to eat entire meal without serious problem behavior (e.g., throwing, hitting, crawling under table, running away). Child may occasionally fuss but can be redirected to activities to occupy attention (e.g., drawing at table, playing with small toys).
3	Uses icons or other symbol systems for choices, schedules etc. independently, if needed at home and at school.						Finds icon/picture/symbol book, selects appropriate icon, and completes choice or activity without assistance. Completes independently at least 80% of time at home and at school. If none are used by child, pass the item.
4	Carries own materials to and from car, school, and home.						Carries at least one material by self. Examples are backpack, lunchbox, jacket, etc.
5	Opens and closes backpack independently; puts in and removes objects when requested.						Puts in/removes at least three objects by self on request. Examples are lunchbox, folder, toy, etc.
6	Dresses and undresses when appropriate (unfastens clothing fasteners – zippers and snaps).						Unfastens zippers and snaps independently.
<b>Skill</b>	<b>Personal Independence: Hygiene L3</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
7	Uses toilet independently, all steps, when taken or sent.						May ask for help with washing hands if cannot reach sink.
8	Manages clothing at toilet except for fasteners.						Pulls down/up underwear and pants. Adult may hold item for child to step in to (if taken off) but child pulls down/up by self.
9	Completes all the hand-washing steps independently.						Turns on/off faucet, uses soap, rubs hands and dries hands. May be reminded.
10	Wipes face with warm washcloth when handed to child.						Places washcloth on face and wipes. May be reminded.
11	Runs brush or comb through hair.						May be reminded
12	Covers mouth when coughing or sneezing.						Covers mouth with hand or tissue. May be reminded.
13	Assists actively in bathing and drying self after bath.						Adult may provide towel, soap, and washcloth or put soap on washcloth but child helps wash and dry body parts (e.g., face, stomach, arms, legs).

14	Brushes teeth with toothbrush, using at least a few strokes.						Brushes up/down at least five or more strokes for top and bottom teeth. Adult may put toothpaste on toothbrush. May be told to keep brushing.
<b>Skill</b>	<b>Personal Independence: Chores L3</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
15	Fees/waters a pet.						Puts food/water in bowl and brings to pet. Adult may assist (e.g., opens can, measures amounts) or remind.
16	Helps clear table.						Takes at least two or more items (e.g., plate, cup, bowl etc.) to sink. May be reminded.
17	Helps empty dishwasher.						Puts away five or more items. Adult may show where item goes. Takes at least two or more items (e.g., plate, cup, bowl, etc.) to sink. May be reminded.
18	Puts clean clothes in drawers.						Places three or more folded clothes neatly in drawers, but need not fold them. May be reminded.
19	Picks up belongings when asked.						Picks up possessions (e.g., clothes, toys, shoes, etc.) and puts away in appropriate location when asked. May be reminded.

## The Early Start Denver Model Curriculum Checklist and Item Descriptors

<b>Name:</b>	<b>Date of Birth:</b>	<b>Date of Assessment:</b>
<b>Parents Interviewed:</b>		<b>Others Interviewed:</b>
<b>Assessor:</b>		

### Level 4

Skill	Receptive Communication L4	Parent	Entry	Q2	Q3	Q4	Description
	Date:						
1	Understands a variety of descriptive physical relationship concepts.						Picks up, gives, points, or shows correct item out of choice of two to adult. Child identified five different concepts correctly. Examples: hot/cold, empty/full, wet/dry, hard/soft, heavy/light, tall/short, long/short, large/small.
2	Retrieves 10-15 items using two to three multiple cues (e.g., size, quantity, colour, object label).						Picks up, gives, points, or shows correct item to adult. Example: Ault asks "Can I have the broken blue crayon?" and child references the correct item.
3	Understands gender pronouns.						Child picks up, gives, points, or shows male or female character, figuring, or live person correctly in response to instructions involving "him or her" or "he or she". Example: "Put him in the car" or "She wants some ice cream". Child must pass at least one female and one male gender pronoun to pass item.
4	Understands comparatives: bigger, shorter, smaller, most, least, few, many, etc.						Picks up, gives, points, or shows correct item to adult out of a field of four to five choices. To pass, child must comprehend three or more comparative sets.
5	Understands spatial relationships involving objects and prepositions: behind, in back of, in front of.						Child demonstrates understanding of these concepts: behind, in back of, in front of by placing objects in correct configurations or looking to correct location when directed (e.g., "Look behind the sofa").
6	Understands negatives (e.g., the box with no balls, the boy who is not sitting).						Picks up, gives, points, or shows correct item that identifies the absence of an object (bowl with no cherries) or feature (child who does not have blue eyes) or a non-occurring action (one who is not sleeping).
7	Understands possessives and part-whole relations.						In objects and pictures, child points to or shows the part of an item when requested (e.g., bunny's nose, tricycle's wheel, door of the car).
8	Demonstrates attention to short stories and comprehension of parts of the story by responding to simple "wh" questions (what and who).						Child listens to simple stories as they are read (five pages). Child demonstrates attention by looking at book with adult and accurately responding to what and who questions, verbally or by pointing, page by page. Answers two to three questions at end.

9	Responds to "yes/no" questions for identify.						Answers questions correctly by verbalising and shaking/nodding head when adult asks, "Is this a _____?" or "Is your name Sam?"
10	Answers questions about physical states.						Child responds correctly with a phrase to questions "Who do you do if...?" for four or more: hurt, tired, hungry, thirsty.
11	Responds to personal information questions.						Responds correctly to three or more personal information questions. Examples: "What's your name?" (first and last), "What's your telephone number?", and "What's your address?"
12	Understands "same" and "different".						Picks up, gives, points, or shows pictures/items correctly given instructions involving finding objects that are the same and pictures/items that are different.
13	Understands quantity concepts.						Picks up, gives, points, or shows objects or pictures correctly in response to these quantity words: one, some, all, few, most. Must pass all to pass item.
14	Identifies features of objects.						Picks up, gives, points, or shows the item with the feature that the adult indicates. Example: Adult says "Show me the dog with the long tail" and child indicates correct answer. Features should involve size, shape, texture, physical state. Pass requires comprehension of 10-15 features.
15	Responds to questions regarding category membership of objects/pictures.						Child understands object categories involving all of these: colour, shape, size, or function; the blue ones, the round ones, the big ones, the ones you eat with.
16	Understands past and future tense.						Child identifies by past tense construction something that has occurred in the past (e.g., "Show me the boy who jumped"). Same for future tense. Child must respond accurately to both past and future, with both regular and irregular verbs.
17	Understands passive voice.						Child demonstrates understanding of passive voice through object manipulations or picture selections (e.g., "The dog was hit by the ball", "The girl is being chased by the boy").
18	Understands temporal relations.						Child accurately responds to instructions involving these three temporal relations: first/last, before/after, at the same time.
19	Follows three-part unrelated verbal instructions.						Complies with adult request that contains three or more components. Example: Adult says "Give me the cup", "Kiss the bear", and "Close the box". Pass requires correct performance on five probes.
<b>Skill</b>	<b>Expressive Communication L4</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Responds to complex 'wh' questions ("Why?" "How?")						Child answers questions regarding these concepts correctly (e.g., "Why do we wash hands?", "How do you brush teeth?")



2	Describes object functions in response to question (e.g., "What do you do with a spoon?")					Can describe functions of five or more common objects using simple phrases.
3	Speaks in three- to four-word utterances consistently.					Across a variety of contexts, partners, and activities.
4	Uses a variety of noun phrases.					Child combines a variety of words to make noun phrases that can be as long as four words in length, including articles, possessives, adjectives, and quantifier (e.g., "The little horse", "My red pen", "This truck", "Two cookies", "The big red square", "A chocolate milkshake", "Some more fries").
5	Uses prepositional phrases (under, next to, behind, in back of, in front of).					Child produces all of these prepositions listed above to describe object arrangements, answer questions, and instruct others in both natural and structured formats.
6	Uses a variety of verb phrases (e.g., he cries, she likes him, he fell, he was happy, he is happy, could, should, would).					Self-explanatory.
7	Demonstrates accurate production of at least 80% of all consonants and consonant blends within connected speech.					Child demonstrates accurate production of 80% of sounds within conversation; speech intelligibility is judged to be good by a naïve listener.
8	Describes recent experience using three- to four-word sentence.					When asked, child describes a recent experience with at least two components of the experiences (who, what, where, when). Examples: "What did you do at your birthday party?", "I got presents from David".
9	Requests permission to pursue an activity.					Child asks permission before beginning a regulated activity: "Can I stir?" (pan on stove), "Can I do it?" (using an adult tool). Also used if child wants to switch activities: "Can we listen to music?"
10	Uses plural forms.					Child uses regular plurals consistently and spontaneously and also uses two irregular forms (e.g., children, mice).
11	Uses later possessives (e.g., his, hers, Mummy's hat).					Child uses these regularly.
12	Uses regular past tense.					Child uses regular past tense forms spontaneously and regularly.
13	Uses articles such as <i>a</i> , <i>an</i> , <i>the</i> .					Child uses these routinely in sentences and phrases.
14	Uses comparatives/superlatives.					Uses five or more correctly: better, best, bigger, biggest, smaller, smallest, fatter, fattest.
15	Uses negation with auxiliary verbs.					Examples: "I am not crying", "I did not hit him", "I will not sit down".
16	Uses present progressive verb form.					Verbalises a phrase including a verb form combining am/is/are with a verb ending in <i>-ing</i> . Example: The boy is riding.

17	Uses words to describe physical states.						Child uses five or more words to describe own states: "I'm hungry, cold, thirsty, tired, hurt".
18	Responds to questions about physical states: "What do you do when you are ___?"						Child responds correctly to five or more.
19	Uses category names for familiar objects.						Refers to an item or group of items by its category name. Examples include animals, vehicles, food, clothing.
20	Describes features of objects.						Child can name three or more features of five common objects when asked "Tell me about a ___".
21	Uses reflexive pronouns.						Uses two or more reflexive pronouns, including myself, yourself, himself, herself, itself, oneself, ourselves, yourselves, themselves.
22	Answers telephone appropriately, including getting person.						Walks to the ringing phone, picks up receiver and puts it to his or her ear, issues a verbal greeting, and gets person who the caller requests.
23	Participates in a conversation that is initiated by an adult for two to three consecutive turns involving a variety of functions (e.g., reciprocal commenting, responding to and requesting information).						Child keeps conversations going by adding elements, asking questions, commenting, sharing experiences, etc. Can use phrase speech but keeps the conversation going through two to three turns on the child's part.
24	Initiates and maintains a conversation on a self-generated topic of conversation with an adult.						Child begins a conversation with a partner with a comment or questions and maintains the topic through at least four conversational turns.
25	Describes a two- to three-event sequence of activities (e.g., going to visit Grandma).						In response to an open-ended question (e.g., "Tell me about your trip to Grandma's"), the child will describe two or three activities or events using phrase speech.
26	Expresses "I don't know" paired with gesture.						When asked a question that the child does not know the answer to, the child responds appropriately.
27	Asks for clarification if doesn't understand what is said.						Child says "What?" or a similar response when child did not hear or understand a comment, question, or instruction directed to the child.
28	Engages in a variety of topics during conversation.						Child initiates conversations on a variety of topics and engages in conversations on a variety of topics.
29	Repairs own communication when listener does not understand.						Child demonstrates use of repair strategies (e.g., repeats, rephrases, combines verbalisation with gesture, adds emphasis) to clarify communication when not understood by partner.
30	Answers questions about self and others.						Child can answer a variety of simple questions about the self and can also answer questions about very familiar others – family members, pets, best friend, etc.
<b>Skill</b>	<b>Social Skills L4</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						

1	Invites peers to play.						Makes one or more verbal or gestural play bids to a peer ("Come play with the train!", "Let's play chase", or waving a peer over).
2	Uses polite forms such as "Excuse me", "Sorry".						Uses several politeness terms including "No thank you", "Thank you", "You're welcome", "Excuse me" and "Sorry".
3	Seeks out others for comfort in a group situation.						When child is scared, hurt, or frustrated, child moves closer to adult or makes physical contact with adult (hugging, sitting on lap, holding hand).
4	Expresses own feelings appropriately.						Verbalises own feelings by saying "I'm mad" etc.
5	Takes turns in informal play independently.						Takes turns with adult/peer when engaged in a play activity without clearly defined turns.
6	Describes an event or experience to peer.						Verbally retells a story to a peer or sibling, including at least three details.
7	Identifies what makes self feel happy, sad, mad, scared.						Verbalises one or more examples for each concept (e.g., happy, sad, mad, scared). Example: Adult says "Why are you sad?" and child says "She took my book and I'm sad".
8	Identifies others' emotions based on situational factors.						During reading activities or conversation, child answers appropriately when asked "Why is she crying?" or "Why is he scared?"
9	Begins to develop coping strategies when feeling upset, mad, or scared.						Engages in one or more coping strategies. Examples: requests a break, asks for help, comes for a hug, gets a comfort object.
<b>Skill</b>	<b>Cognition L4</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						
1	Counts rotely to 20.						Counts out loud from 1 to 20 in sequential order.
2	Counts objects with 1:1 correspondence to 10.						Touches or points to pictures or objects while counting in sequence, touching or pointing once for each number.
3	Gives "one", "some", "a lot", "a little", "all of them", "more" and "most.						Hands correct number of items to adult when adult requests.
4	Gives quantities through 10.						Hands correct number of items to adult when adult request ("Give me five cookies" or "Can I have two pillows?").
5	Knows terms for quantity concepts.						Verbalises two or more concepts, including "one", "some" and "all".
6	Knows terms for spatial relations.						Verbalises two or more concepts, including behind, in back of, and in front of.
7	Matches and understands 5-10 word/object associations.						Matches five or more objects with the associated written three- to four-letter word.
8	Can read some words.						Reads and pronounces 10 or more three- to four-letter words for common actions and objects.
9	Can identify written name out of a field of five.						Gives, points, shows, or goes to his or her own name when name is shown in an array of three names that includes one name that begins with the same letter as the child's name.

10	"Reads" signs and symbols.						States the meaning of three or more common signs and symbols. Example: stop sign, green light, universal "no" symbol.
11	Identifies numbers and letters.						Receptively identifies and expressively states the names of all letters of the alphabet and numbers 0-30.
12	States opposites and analogies.						When adult states a concept, child names the concept for the opposite. Example: Adult says "A mouse is little but an elephant is _____", and child says "big".
<b>Skill</b>	<b>Play L4</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	Date:						
1	Demonstrates actions of figures in play.						Has figures carry out five or more actions in three or more play scenarios. Example: Mummy driving to store, brother chasing sister, or doggie eating food.
2	Uses placeholder items to symbolise props in play.						Uses three or more neutral placeholder items. (Neutral = no identity of its own). Examples: using a block as a phone, a tube as a bottle, or a small box as a car.
3	Labels actions and pretend props in play.						Labels 10 or more pretend actions and/or pretend props in three or more play activities spontaneously and in response to questions.
4	Spontaneously links three or more related behaviours in a play theme.						Examples: pouring water in pot, stirring food, and pouring food in bowl; putting on firefighter hat, "driving" fire engine truck, and putting out fire.
5	Directs partner in play.						Provides three or more relevant instructions directed to partner to carry out some aspect of play theme across two or more play episodes.
6	Plays out several life events (e.g., birthday party, McDonald's, doctor), including use of verbal scripts.						Plays out three or more life events, each containing at least three embedded activities (see item 4 above), interacting with partner through verbal scripts and object actions.
7	Plays out several story themes in play.						Plays out three or more story themes with partner using multiple actions and scripts as described in the item above. Examples: Little Red Riding Hood, Three Little Pigs, Billy Goats Gruff.
8	Takes on a character role and plays it out.						States role (e.g., "I'm the Mummy") and plays out a life scene with verbal script, activities, and gestures appropriate to role, with three or more exchanges to partner.
9	Follows another's lead in play.						Follows partner's play directives verbally or nonverbally five or more times by imitating partner's acts or responding to partner's instructions.
<b>Skill</b>	<b>Fine Motor L4</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	Date:						
1	Colours in picture with accuracy using different colours.						Child colours mostly inside shapes and chooses different colours to complete picture on colouring book-type page.

2	Imitates triangle, letters using appropriate drawing utensil.						Child copies circle, square, triangle, and some alphabet letters recognisably.
3	Draws lines and shapes and some letters and numbers from memory.						Child initiates drawing several shapes and letters/numbers that are recognisable.
4	Imitates and copies a variety of letters, numbers, and shapes.						Child both copies and generates four to five shapes, four to five letters, and several numbers that are recognisable.
5	Writes first name without a model.						Self-explanatory.
6	Traces shapes and letters.						Self-explanatory.
7	Colours in shapes that are outlined.						Child keeps colouring generally inside borders.
8	Connects dots with drawing tool.						Child can follow dot-to-dot patterns and can follow the number sequence.
9	Connects lines to and from corresponding pictures, words, or shapes.						Child can connect matching or related pictures of objects with a line (as in a child workbook activity).
10	Copies a variety of simple representational drawings (e.g., face, tree, house, flower).						Child copies five or more different line drawings and makes two to three recognisable pictures spontaneously.
11	Fold paper in half and puts in envelope.						Self-explanatory, following model.
12	Cuts out angles, straight lines, and curves.						Child cuts out corners and edges of large shapes (3 inches or more) using child scissors independently.
13	Cuts out simple shapes.						Child successfully cuts out 3-inch shapes.
14	Completes three-step art projects – cut, colour, and paste.						Once adult models the activity, child can sequence the activity and complete it independently as long as each step involves a skill at which child is fully competent.
15	Uses paintbrush, stamps, markers, pencils, erasers to complete art activities.						Child uses a variety of art materials in an open-ended art activity to create products. Child can also imitate an adult's model using each of these tools.
16	Uses a tripod grasp with drawing tool.						Child consistently holds writing implements with a mature tripod grasp.
17	Builds with a variety of building materials with own design and copies simple models from pictures or 3-D models.						Child assembles a variety of building materials into complex designs and can also copy other's designs, both from 3-D models and from photos and line drawings. Child can demonstrate five or more different models.
18	Puts together interlocking puzzles, floor puzzles, tray puzzles.						Self-explanatory.
19	Uses tape, paper clips, keys appropriately.						Uses all these tools independently.
<b>Skill</b>	<b>Gross Motor L4</b>	<b>Parent</b>	<b>Entry</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Description</b>
	<b>Date:</b>						

1	Plays catch with playground-sized ball with a peer.						Can keep a catch game going through six or more turns.
2	Throws tennis ball or baseball to another person with directionality using overhand throw.						Self-explanatory.
3	Uses all playground equipment independently, including swing, merry-go-round.						Self-explanatory, for all age-appropriate equipment.
4	Kicks a moving ball.						Child adjusts body and successfully kicks a ball in motion.
5	Plays various games with balls: Throws ball in basket, hits T-ball with bat, bounces ball, golf club, beanbag toss.						Plays five or more games with balls.
6	Rides bicycle confidently with training wheels; able to control speed, maneuver, and break.						Self-explanatory.
7	Gallops and skips.						Imitates both and performs smoothly.
8	Walks without falling off balance beam, railroad ties, sidewalk curbs.						Self-explanatory; walks relatively smoothly and not too slowly.
9	Plays typical motor games (e.g., "Red Light, Green Light", "Red Rover", "Freeze Tag").						Plays five or more such games – knows the rules and participates actively through the game and without prompting or coaching.
<b>Skill</b>	<b>Personal Independence L4</b>	Parent	Entry	Q2	Q3	Q4	<b>Description</b>
	<b>Date:</b>						
1	Manages all steps involved in toileting independently at the level of peers.						Uses potty as needed (though adult may prompt trips to the toilet), pulls own pants/underwear up and down, flushes, and washes hands.
2	Takes self to toilet as needed.						Takes self to toilet as needed (no adult prompting needed).
3	Washes hands independently at level of peers.						Child turns on faucet, puts hands under water, applies soap to hands, rubs soaped hands together, rinses soap off, turns off water, and dries hands on towel.
4	Washes face with washcloth independently.						During bathtime, child wets washcloth, applies soap, and scrubs face with a washcloth.
5	Independently brushes or combs hair.						When adult asks child to comb/brush hair, child gets tool and runs tool throughout hair. May be age-appropriate exceptions for difficulties with long or curly hair.
6	Actively assists with bathing, dries self after bath.						Rubs body with washcloth, applies soap to body, and scrubs own scalp when shampoo is applied. Dries self reasonably well; may need "touch-up".

7	Carries out all steps for toothbrushing independently, though adult may also brush teeth for thoroughness.						From the time the child enters bathroom until toothbrush and toothpaste are returned to proper place, child can carry out all the steps independently.
8	Fastens own clothing – buttons, snaps, and zippers.						Fastens own buttons, snaps, zippers, and clips when they are present on child’s outfit.
9	Blows nose when cued, uses tissue to catch sneezes, covers cough and sneeze.						When adult says “Blow your nose”, child retrieves a tissue and blows nose into tissue. When child sneezes, he or she covers mouth with hand or arm.
10	Stops at street; crosses after looking both ways when accompanied.						When approaching a curb or street with partner, child automatically stops, waits, looks, and waits for partner to indicate that the child may cross.
11	Walks safely beside adult independently in parking lots, stores, etc.						Child walks without holding hands and stays close to adult, monitoring adult location and maintaining proximity on own initiative.
12	Helps with table setting.						Child can place plates, cups, napkins, and utensils at the correct places independently and relatively neatly. Adult may need to mark what places to set and can provide child with the materials on the table.
13	Uses knife to spread.						Child can spread jelly-type consistencies over the surface of a piece of bread without tearing the bread.
14	Cleans up after spills.						Child cleans up spills at a table on own initiative and does a thorough job of it.
15	Pours self drink from small container.						Child can pour from a 2-4 cup pitcher into a small cup neatly and independently.
16	Places dishes in sink, counter, or dishwasher.						After meals, the child routinely cleans up his or her place and puts eating implements in correct location independently.
17	Makes a two-step snack.						Gets out two different items, places from container to plate, places at table. Examples: sets out cut-up veggies and dip, cheese and crackers, spreads cream cheese on crackers, fixes cereal and milk.
18	Assists with cooking activities: stirs, pours, etc.						Child participates in multiple steps of multistep cooking activity like making cookies, pancakes, and scrambled eggs.

## Appendix H – Sample Teaching Plan

Daily Data Sheet

Child: xxxx

Date: xx/xx/xx

Behaviour Coding				
15	30	45	1hr	Total

RC4.4 During play activities with many different objects (at least 5 objects) and adult asks to identify a comparative set (longer/shorter, most/least), Jaxon will pick up/give/point/show the correct object, across 4/5 different comparative sets, over 3 consecutive sessions, with 2 or more settings/people.					RC4.5 When the adult asks Jaxon to put an item behind/in back of/in front of another object, he will demonstrate his understanding of all 3 concepts by placing several different items in the corresponding location, on 4/5 occasions, over 3 consecutive sessions, 2 people/settings.				
15	30	45	60	Steps	15	30	45	60	Steps
				Indicate correct item, FP 1/5 comparative sets					Place 1-2 objects in location, 1 concept, FP 1/5 occasions
				Indicate correct item PP 2/5					Place 3-4 objects in location, 2 concept PP 2/5
				Indicate correct item 3/5					Place 5 objects in location, 3 concepts 3/5
				Indicate correct item 4/5					Place several objects in location, all 3 concepts 4/5
				Indicate correct item 4/5 with gen					Place several objects in location, all 3 concepts 4/5 with gen

RC4.7 During play with objects and pictures, and when adult asks Jaxon to show a particular part of the item (eg. Show me the bunny's nose), he will demonstrate understanding of possessives and part-whole relations by pointing to the correct part, across 4/5 different pictures and objects, over 3 consecutive sessions and with 2 partners/settings					EC4.1 When adult asks Jaxon a "why/how" question, he will use a "Because..." phrase to answer the why question correctly or show the adult "how" by modelling the action, across 4/5 different why and how questions, over 3 consecutive sessions, and with 2 people/settings.				
15	30	45	60	Steps	15	30	45	60	Steps
				Points to part of item, FP 1/5 objects OR pictures					Imitates the answer FP 1/5 how OR why questions
				Points to part of item, PP 2/5 objects OR pictures					Correctly answers PP 2/5 how OR why questions
				Points to part of item, 3/5 objects AND pictures					Correctly answers 3/5 how AND why
				Points to part of item, 4/5 objects and pictures					Correctly answers 4/5 how and why
				Points to part of item, 4/5 objects and pictures with gen					Correctly answers 4/5 how and why with gen

EC4.2 When the adult asks questions about the function of common objects (eg What do you do with a spoon?), Jaxon will use a simple phrase to describe the purpose of 8-10 different objects, on 4/5 opportunities over 3 consecutive sessions, and with 2 people/settings.					EC4.5 When the adult asks where an object is located, Jaxon will answer by producing all 5 prepositional phrases (under, next to, behind, the back of, in front of) to describe several different object arrangements/locations, on 4/5 occasions over 3 consecutive sessions, with 2 people/settings.				
15	30	45	60	Steps	15	30	45	60	Steps
				Describes function using 1 word, 1-2 objects, FP 1/5 opps					Produce 1 preposition, with 1-2 objects, FP
				Describes function using 1-2 words, 3-4 objects, PP 2/5					Produce 2 prepositions, with 3-5 objects, PP
				Describes function using simple phrase, 5-7 objects, 3/5					Produce 3 prepositions, with 7+ objects
				Describes function using simple phrase, 8-10 objects, 4/5					Produce all 5 prepositions, several objects
				Describes function using simple phrase, 8-10 objects, 4/5 with gen					Produce all 5 prepositions, several objects with gen



SS4.2 When adult offers Jaxon an object/activity, he will take or refuse the offer using politeness terms appropriately and spontaneously (No thank you, thank you), across 4/5 opportunities across 3 consecutive sessions, with at least 2 partners/settings.					SS4.4 When Jaxon is showing early warning signs that he is agitated (hiding head in hands, angry facial expression) and adult acknowledges the problem and asks how he is feeling, Jaxon will verbalise his feelings appropriately "I'm mad/angry/sad", on 4/5 opportunities over 3 consecutive sessions, with at least 2 or more people/settings.				
15	30	45	60	Steps	15	30	45	60	Steps
				Uses 1 politeness terms, FP 1/5 opps					Expresses feelings verbally 1/5 FP
				Uses 2 politeness terms, PP 2/5 opps					Expresses feelings verbally 2/5 PP
				Uses 2 politeness terms 3/5 opps					Expresses feelings verbally 3/5
				Uses 2 politeness terms, spontaneously 4/5 opps					Expresses feelings verbally 4/5
				Uses 2 politeness terms, spontaneously, 4/5 opps with gen					Expresses feelings verbally 4/5 with gen

SS4.5 When playing a game or activity involving turns, and when an adult/peer has completed their turn, Jaxon will initiate his turn naturally and informally (without it being announced by himself or partner), across 4/5 different games/activities over 3 consecutive sessions, and with 2 adults/peers in 2 different settings.					C4.4 When the adult asks Jaxon to hand over a number of items, he will independently count the correct number of items that was requested and gives to the adult, ranging from 1-10 objects, on 4/5 occasions over 3 consecutive sessions, and with 2 people/settings.				
15	30	45	60	Steps	15	30	45	60	Steps
				Takes turns FP 1/5 games/activities					Counts out and gives to adult, 1-3 objects FP, 1/5 occasions
				Takes turns PP 2/5 games/activities					Counts out and gives to adult, 1-5 objects PP, 2/5 occasions
				Initiates his turns 3/5 games/activities					Counts out and gives to adult, 1-7 objects 3/5 occasions
				Naturally and informally takes turns 4/5 games/activities					Counts out and gives to adult, 1-10 objects, 4/5 occasions
				Naturally and informally takes turns 4/5 games/activities with gen					Counts out and gives to adult, 1-10 objects, 4/5 occasions with gen

C4.7 When the adult models matching word-object associations and offers a turn to Jaxon, he will place the object on the written 3-4 letter word, matching 5 or more word-object sets, on 4/5 opportunities across 3 consecutive sessions, and with 2 people/settings.					C4.8 When the adult shows Jaxon written words and asks him to read the word, Jaxon will read and pronounce at least 10 three-four letter words, including common actions and objects, on 4/5 opportunities over 3 consecutive sessions, and with at least 2 people/settings.				
15	30	45	60	Steps	15	30	45	60	Steps
				Matches 1x 3 letter word-object set FP 1/5 opp					Reads/pronounces 1-3 three letter words, actions OR objects FP 1/5 opps
				Matches 2x 3 letter word-object sets PP 2/5 opp					Reads/pronounces 3-5 three letter words, actions AND objects PP 2/5 opps
				Matches 3x 3-4 letter word-object sets 3/5 opp					Reads/pronounces 6-8 three-four letter words, actions and objects VP 3/5 opps
				Matches at least 5x 3-4 letter word-object sets 4/5 opp					Reads/pronounces at least 10 three-four letter words, actions and objects 4/5 opps
				Matches at least 5x 3-4 letter word-object sets 4/5 opp with gen					Reads/pronounces at least 10 three-four letter words, actions and objects 4/5 opps with gen

P4.1 During dramatic play activities and when the adult offers Jaxon miniature figures, he will use them to act out at least 5 actions within 3 or more play scenarios, across 4/5 activities, over 3 consecutive sessions, and across 2 settings/people.					P4.3 During pretend play activities and when the adult approaches Jaxon or asks him what he is doing, Jaxon will use verb phrases to label 10 or more pretend actions across 4/5 different play activities, over 3 consecutive sessions, across 2 partners/settings.				
15	30	45	60	Steps	15	30	45	60	Steps

				2 actions x 2 scenarios FP 1/5 activities					Labels 2-4 actions x 1/5 activities FP
				3 actions x 3 scenarios PP 2/5					Labels 5-7 actions x 2/5 activities PP
				4 actions x 3 scenarios 3/5					Labels 8-10 actions x 3/5 activities
				At least 5 actions x 3 or more scenarios 4/5					Labels 10 or more actions x 4/5 activities
				At least 5 actions x 3 or more scenarios 4/5 with gen					Labels 10 or more actions x 4/5 activities with gen

FM4.4 In response to the adult writing a variety of letters, numbers and shapes, Jaxon will imitate at least 5 recognisable figures across all 3 categories (letters, number, shape), on 4/5 opportunities over 3 consecutive sessions, and with 2 people/settings.					FM4.11 During craft activities and when the adult places a folded piece of paper in an envelope, Jaxon will imitate the adult and independently fold and crease a piece of paper and place it in the envelope, on 4/5 occasions across 3 consecutive sessions, and with 2 people/settings.				
15	30	45	60	Steps	15	30	45	60	Steps
				Imitates 1-2 figures across 1 category FP 1/5					Places paper in envelope FP 1/5 occ
				Imitates 2-3 figures across 2 categories PP 2/5					Creates paper and puts in envelope PP 2/5
				Imitates 4-5 figures across 2 categories VP 3/5					Folds, creases paper and puts in envelope VP 3/5
				Imitates at least 5 figures across 3 categories 4/5					Independently folds, creases and puts in envelope 4/5
				Imitates at least 5 figures across 3 categories 4/5 with gen					Independently folds, creases and puts in envelope 4/5 with gen

FM4.13 During worksheet activities involving simple shapes and when the adult offers Jaxon a pair of scissors, he will use the scissors to cut out 4/5 common 3-inch shapes, across 3 consecutive sessions with 2 people/settings.					GM3.6 When the adult throws a ball underarm at target and asks Jaxon to join in, he will use an underarm throw to aim a ball towards target on 4/5 opportunities, across 3 different ball games, over 3 consecutive sessions, and with 2 settings/people.				
15	30	45	60	Steps	15	30	45	60	Steps
				Cuts out 1/5 five-inch shapes, FP					Throws underarm in any direction FP 1/5 opps
				Cuts out 2/5 five-inch shapes, PP					Throws underarm towards target, 1 game PP 2/5
				Cuts out 3/5 four-inch shapes					Throws underarm towards target, 2 games 3/5
				Cuts out 4/5 three-inch shapes					Throws underarm towards target, 3 games 4/5
				Cuts out 4/5 three-inch shapes with gen					Throws underarm towards target, 3 games 4/5 with gen

GM3.7 During gross motor games and dances and when the adult models jumping forward, Jaxon will jump forward with 2 feet together at least 3 times in a row, on 4/5 opportunities across 3 consecutive sessions and with 2 settings/people.					GM3.8 During gross motor games and adult models hopping on one foot, Jaxon will hop 2-3 times in a row without falling, on 4/5 opportunities, across 3 consecutive sessions, and with 2 partners/settings.				
15	30	45	60	Steps	15	30	45	60	Steps
				Jumps forward 1x, 2 feet together FP 1/5					Hops 1 time FP 1/5
				Jumps forward 2x, 2 feet PP 2/5					Hops 1-2 times in a row PP 2/5
				Jumps forward 2x independently 3/5					Hops 2 times in a row 3/5
				Jumps forward at least 3x 4/5					Hops 2-3 times in a row 4/5
				Jumps forward at least 3x 4/5 with gen					Hops 2-3 times in a row 4/5 with gen

**PARENT INTERVIEW**

PI4.7 During the morning and evening daily routines and when you (parent) ask Jaxon to clean his teeth, he will enter the bathroom and complete each step independently, up to the final step of putting his brush away, for most of the					PI4.9 When you (parent) notice Jaxon pause and inhale (feeling the onset of a sneeze/cough) and you immediately cue him to cover his mouth, Jaxon will catch his sneeze/cough into his elbow and blow his nose into a tissue (if necessary), for most of the time over 3 consecutive				
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time, over 3 weeks in a row, with both parents at home and at his grandparents house.					weeks, at home with 2 parents, grandparents and 2 educators at preschool.				
15	30	45	60	Steps	15	30	45	60	Steps
				Attempts to clean with brush, rinse and put toothbrush away, <b>with your physical help</b> , sometimes					Covers mouth with elbow, <b>with your physical help</b> , sometimes
				Puts toothpaste on brush, attempts to clean teeth, rinse, toothbrush away, <b>with your verbal reminders</b> , half the time					Covers mouth with elbow and blows nose, <b>with your verbal reminders</b> , half the time
				Completes the whole routine and brush away, half the time					Covers mouth with elbow and blows nose, half the time
				Completes the whole routine <b>independently</b> , most of the time					Covers mouth with elbow and blows nose, most of the time
				Completes the whole routine independently, most of the time, and with 2 parents and grandparents house					Covers mouth with elbow and blows nose, most of the time, and with 2 parents, grandparents, and 2 educators at preschool

NOTES:

**PLAY PARTNER DECISION TREE**

ACTION PLAN	FIRST STEP	SECOND STEP	THIRD STEP	FOURTH STEP
<p><b>supportive play partner</b></p>	<p>Approach the child when he/she is playing with an enjoyable activity</p> <ul style="list-style-type: none"> <li>• Sit near/opposite child and back up if he/she fusses</li> <li>• Watch, smile, comment positively</li> </ul> <p><b>The goal is to have the child accept your presence.</b></p>	<p>Narrate the child's actions using one word only. Comment on</p> <ul style="list-style-type: none"> <li>• Materials</li> <li>• How the child is using the materials</li> <li>• Don't worry about touching materials or teaching yet</li> </ul> <p><b>The goal is to slowly increase your involvement without challenging the child.</b></p>	<p>Slowly involve yourself in play</p> <ul style="list-style-type: none"> <li>• Offer materials</li> <li>• Make sure you have 2 of each</li> <li>• Only touch materials not yet claimed by the child.</li> <li>• Continue to narrate</li> </ul> <p><b>The goal is for the child to watch you hand the materials over, eye contact to receive the materials is not necessary at this point.</b></p>	<p>Be helpful</p> <ul style="list-style-type: none"> <li>• Place object containers\ looking</li> <li>• Show new toy operate on</li> <li>• Be sure to go back when</li> </ul> <p><b>The goal is for the child to be helpful w</b></p>
<p><b>Interactive play partner</b></p>	<p>Follow steps 1-4 above.</p> <p>If the child is still engaged, proceed with the following</p> <ul style="list-style-type: none"> <li>• Imitate all child's sounds and actions</li> <li>• Imitate his/her actions with same materials</li> <li>• Use one word to narrate the each action</li> </ul> <p><b>The goal is to gain eye contact to your face and materials, and to find the smile.</b></p>	<p>Start offering choices</p> <ul style="list-style-type: none"> <li>• For every 3 times you imitate the child, offer a choice related to the play eg: Roll or crash?</li> <li>• Don't worry about eye contact yet</li> </ul> <p><b>The goal is for the child to become more active in decision making and to increase the length of the activity.</b></p>	<p>Slowly increase your play ideas</p> <ul style="list-style-type: none"> <li>• For every 3 times you offer a choice, ask him/ her to do something in the play (put/show/give etc)</li> <li>• Make sure there is a fun reward in you face and voice, so that the consequence is worth the effort</li> </ul> <p><b>The goal is for the child to become more active and take turns following your ideas in play.</b></p>	<p>Provide teaching</p> <ul style="list-style-type: none"> <li>• For every 3 fun reward, respond to the child with a nonverbal contact, gesture (movement)</li> <li>• The behavior directed to the activity</li> <li>• Accept all attempts from the child with intentional behavior</li> <li>• Use your cue (anticipate) to direct the child to the reward (con</li> </ul>

**Appendix I – Play Partner Decision Tree**

## Appendix J – Fidelity Scale

### Early Start Denver Model Fidelity Coding Sheet

**Therapist:**            **Rater and Date:**

**Child and episode:**

Item	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6
A. Management of child attention						
B. ABC Format						
C. Instructional techniques						
D. Modulating child affect/arousal						
E. Management of unwanted behavior						
F. Use of turn taking /dyadic engagement						
G. Child motivation is optimized						
H. Adult use of positive affect						
I. Adult sensitivity and responsivity						
J. Multiple varied communicative functions						
K. Adult language						
L. Joint activity and Elaboration						
M. Transition between activities						
Comment columns for note taking						