Behaviours of Children with Autism that Facilitate Social Play with Typically Developing Peers in an Early Childhood Setting

Kim Heather Kliman

Bachelor of Applied Science (Speech Pathology)

Graduate Certificate in Autism Studies

Professor Jacqueline Roberts: Principal Supervisor

Doctor Kate Simpson: Associate Supervisor

Submitted in fulfilment of the requirements of the degree of Master of Education and

Professional Studies Research

School of Education and Professional Studies

Griffith University

30 May, 2017

Abstract

Play is an integral component of child development, particularly in the development of social-communication skills. Although not a defining characteristic of autism, differences in the frequency and quality of play in children with autism are identified in the literature. However, in much of the research into play behaviours and social participation in young children with autism, engagement in play with adults or children with other disabilities is examined. There is little research examining play with typical peers. Furthermore, there is limited research examining play in a natural context, as opposed to a clinical setting.

Given the social aspects of play, examination of play in a natural context with typically developing peers is necessary to gain an accurate and relevant description of play in children with autism. Therefore, this gap in the literature is addressed in this research project by identifying what play behaviours young children with autism display during play with their typically developing peers in an early childhood setting. Additionally, in this research project, the participants' teacher's perception of behaviours in young children with autism is described.

In this study, the play of four children with autism (4-5 years old) with their typically developing peers is explored. The research was conducted in an inclusive early childhood setting. Data were collected in two phases.

Phase 1 data collection consisted of semi-structured interviews with the participants' early childhood educator. Data analysis of phase 1 involved thematic analysis of the interviews to identify the teacher's perception of how the children with autism engage in play with peers. Data from phase 1 also provided context for play behaviours observed in phase 2.

Phase 2 data collection included descriptive observations of children with autism engaging in parallel, associative, and cooperative free-play with their peers recorded using an Antecedent-Behaviour-Consequence template. Each child was observed for 40 minutes on

three separate occasions. Phase 2 also involved the collection of frequency data identifying the occurrence of parallel, associative, and cooperative play acts. Data analysis of phase 2 involved thematic analysis of participants' behaviours to identify key play behaviours used by young children with autism. Additionally, quantitative data analysis was undertaken by calculating the frequency of parallel, associative, and cooperative play acts.

Six key themes were identified from the interviews. These included (1) special interests and skills, (2) physical activity, (3) role of peers, (4) conflict management, (5) verbal behaviours, and (6) enjoyment. Themes identified through the observations included (1) proximity, (2) verbal behaviours, (3) nonverbal behaviours (4) object transfer, (5) complexity of play, and (6) adult interactions. In addition, quantitative data analysis showed that participants all engaged in parallel, associative, and cooperative play acts, however the proportion of types of social participation differed across participants.

From this study, our understanding of play in children with autism is enhanced by the identification and description of play behaviours used by young children with autism in a natural context with typically developing peers. It highlights the complex relationship between characteristics of young children with autism, peer relationships, and environmental factors in social play. This raises potential clinical implications for intervention. Particularly, the role of individual skills and interests, and that of their peers, must be considered when formulating an individualised intervention plan targeting play skills. Furthermore, by identifying play behaviours used by young children with autism, the findings of this project potentially inform broader research in autism and play in the future, to further investigate these key behaviours.

Acknowledgements

I am grateful for the opportunity Griffith University has given me to develop my research skills. I would like to express my sincere gratitude to my academic supervisors; Professor Jacqueline Roberts, Dr Kate Simpson, and Dr Amanda Webster, for their ongoing professional support and guidance. Their passion, and patience, has been invaluable. They have taught me to appreciate the intricacies of research and demonstrated how to put the principles of education into practice.

I would also like to thank my family for supporting me through this rigorous period. Thank you to my parents for their ongoing support. Thank you to my husband for his ongoing encouragement and for holding the household together while I retreated to complete my thesis. Finally, thank you to my children who stayed awake to keep me company in the middle of the night while I worked.

Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

_____

Kim Heather Kliman

Table of Contents

Glossary

Key Term	Definition
	Communication
Expressive language	The ability to express oneself through language. The focus of this study is verbal expressive language, referring to the use of spoken language.
Functional language	Functional language refers to the ability to understand and use language to the extent that the individual can understand basic verbal messages and verbally express basic needs and ideas.
Nonverbal communication	A method of communicating a message without speaking, such as the use of gesture or facial expressions.
Receptive language	The ability to process and understand what is said or written. The focus of this study is on verbal receptive language, referring to the understanding of what is heard.
Verbal communication	The use of sounds and words to convey a message.
	Early Childhood
Inclusive early childhood setting:	An educational setting where both typically developing children and children with a disability, aged less than 6 years old, attend and are supported together in the years leading up to beginning school.
Preschool-aged child	A child who is less than 6-years old and has not yet begun formal schooling.

Key Term	Definition
	Social-Communication and Play
Associative play	Describes the social participation during play of at least two people engaged in a similar play activity. Participants share objects or engage in conversation, but do not collaborate ideas or assign different roles (Parten, 1932).
Cooperative play	Describes the social participation of at least two people during play where each person takes on a different role or contributes ideas to achieve a common goal (Parten, 1932).
Free-play	Describes the context of play where children can move around a space and select which play activity they will participate in. For the purpose of this study, play is led by children, with adults taking on a supervisory role only.
Functional play	The conventional use of an object, or conventional association of at least two objects, during a recreational activity (Williams, Reddy, & Costall, 2001), such as stirring a toy cup with a spoon.
Nonverbal play behaviour	Object use and gesture during play.
Parallel Play	Describes social participation during play between at least two people where participants play alongside each other in a similar activity without engaging directly with each other (Parten, 1932).
Play	A pleasurable, intrinsically motivated, active experience, in which children engage in the world around them for recreational purposes (O'Grady & Dusing, 2015).

Key Term	Definition
	Social-Communication and Play
Play activity	A recreational task that involves a single theme, agenda, or task.
Play behaviour	A verbal or nonverbal behaviour or action that contributes to a play activity.
Symbolic play	The use or performance of objects and actions in a way that does not represent current reality (Orr & Geva, 2015). For example, lining up chairs and sitting down to pretend to be on a bus.
Verbal play behaviour	Verbalisation that contributes to a play activity.

List of Tables

List of Figures

Introduction

In this chapter, the background to the research project, including defining key terms and describing the context, purpose, and significance of the research is outlined. Additionally, the overarching objective of the project is stated and subsequent research questions are listed. A summary of the research project's potential significance and contribution to the field of autism and play is presented at the conclusion of this chapter.

Definition of Key Terms

Autism is a neuro-developmental condition that is heterogeneous in the nature of behaviours (Lai, Lombardo, & Baron-Cohen, 2014) and characterised by a dyad of deficits in the areas of social communication and social interactions, and restricted and repetitive behaviours (American Psychiatric Association, 2013). The term autism encompasses Autism Spectrum Disorder and includes children identified using a range of diagnostic systems, including Diagnostic and Statistical Manual of Mental Disorders 4th edition (American Psychiatric Association, 2000), Diagnostic and Statistical Manual of Mental Disorders 5th edition (American Psychiatric Association, 2013), and International Statistical Classification of Diseases and Related Health Problems 10th edition (World Health Organization, 1992). Deficits in social-communication skills include both verbal and nonverbal behaviours used in reciprocal social interactions (Wetherby, Watt, Morgan, & Shumway, 2007). Restricted and repetitive behaviours include stereotyped behaviours, abnormal interests, and inflexible adherence to rules and routines. Engagement in such behaviours may restrict children's participation in age appropriate activities, such as play (Carpenter, 2009).

Play refers to a pleasurable, intrinsically motivated, active experience, in which children engage in the world around them for recreational purposes (O'Grady & Dusing, 2015). Interacting during play is positively associated with social competency. Play interactions with peers provide vital opportunities to acquire and rehearse skills required for

the development of social competence (Jenvey & Newton, 2011). Children with autism demonstrate less developed play skills than typically developing peers (Hobson, Hobson, Malik, Bargiota, & Caló, 2013). Additionally, limitations in play skills in children with autism are associated with impairments in communication and social interactions (Hobson et al., 2013). Though less well studied, play therefore provides an important contribution to social-communication skill development in young children with autism (Jenvey & Newton, 2011).

Context

In the proposed research project, play behaviours in preschool-aged children with autism are examined in a natural context with typically developing peers. As the aim of this study was to observe play with peers, children with autism who were in the later years of their early childhood education, and therefore more likely to engage in play with peers, were observed. For this reason, children aged 4 to 5 years old, who would be starting school in the subsequent year were recruited. Participants had verbal language skills to sufficiently meet the basic demands of their daily routine, communicated with peers using sentences, and demonstrated the ability to use objects as they were designed to be used in play.

A mixed methods approach applied through a pragmatic paradigm was used. Both qualitative and quantitative data analysis was conducted across two phases of data collection to address the primary and secondary research questions. Data were collected from an inclusive early childhood centre. Congruent with a pragmatic paradigm, collecting data from a natural context, as opposed to a clinical environment, provides a more authentic representation of naturally occurring play.

Purpose

The primary aim of this research project is to describe behaviours in 4 to 5 year old children with autism during play with typically developing peers in an early childhood

setting. Behaviours recorded include both verbal and nonverbal behaviours. The secondary aim of this research project is to identify behaviours young children with autism display during play with their typically developing peers from the perspective of an early childhood teacher. Play is an integral part of child development (Murdock & Hobbs, 2011). Play can be a tool for exposing a child to new experiences, develop self-regulation skills and higher cognitive functioning, provide an opportunity to explore sensory and motor skills, develop social-communication skills, and practice and reinforce skills needed for the future (Tsao, 2002). The development of play in children with autism, who experience difficulties in social-communication skill development, is therefore a highly relevant area of study. However, there is currently a gap in the literature in relation to the way children with autism successfully engage in play with typically developing peers in a natural context. Further examination can guide the setting of meaningful goals targeting play in children with autism to potentially have a positive impact on peer interactions.

Significance

Consistent with a pragmatic paradigm, practical answers to questions about play in children with autism in an inclusive early childhood setting are sought in this study. Such information can guide educators to further understand play behaviours and subsequently develop meaningful intervention goals targeting play for children with autism in early childhood settings. This project provides a useful pilot study for future research in this field and suggests trends that could be examined in a larger study.

As demonstrated in the literature review, examination of free-play of children with autism with typically developing children in a natural environment is not sufficiently addressed. This study takes place in an inclusive early childhood setting and therefore represents the way play skills in children with autism are used in a natural setting. Additionally, the consequence of play behaviours of children with autism on the continuity of

social interactions in play with typically developing children are identified. Given the

significance of play for typically developing children, particularly in the areas of social-

communication development and as a tool for understanding the world, examining play in

children with autism who experience difficulties in these areas is highly relevant.

Literature Review

The focus of this literature review is play behaviours and social participation during play in preschool-aged children with and without autism. The purpose of play and its association with social competency in typically developing children is outlined before examining how play is defined and measured. Two main aspects of play in children with autism are explored. First, a review of the literature addressing play behaviours of preschool-aged children with autism is conducted. Second, research into the social participation of preschool-aged children with autism during play is discussed. Finally, gaps and limitations in the research that led to the formulation of this research project are summarised.

Purpose of Play and Its Association with Social Competency in Typically Developing Children

Play is defined as a pleasurable, intrinsically motivated, active experience, in which children engage in the world around them for recreational purposes (O'Grady & Dusing, 2015). Various theories have been proposed to explain the purpose of play, all of which view play as an integral part of child development (Murdock & Hobbs, 2011). Piaget (2013) considered play as a reflection of development and a tool for exposing a child to new experiences, while Vygotsky (2004) viewed play as a tool for developing self-regulation and higher cognitive functioning. Other researchers discuss play as an opportunity to practice and reinforce skills needed for the future (Tsao, 2002). Overall, play is viewed as an enjoyable activity that contributes to a child's ability to form symbolic representations of the world and develop sensory, motor skills, and social-communication skills (Tsao, 2002).

Describing Social Participation and Play in Typically Developing Children

Peer interactions during play are explored in the literature through descriptions of social participation. Parten (1932) was the first researcher to recognise the need to examine and define social participation of children during social interactions. This study has been one

of the most influential studies into the development of play (Xu, 2010) and provides a framework to describe the play between children with autism and their peers.

Parten (1932) observed 42 children, aged 1 to 5 years old, during free-play at the children's nursery and categorised social participation into six different levels of participation. These include unoccupied behaviour, onlooker, solitary independent play, parallel activity, associative play and cooperative play. Unoccupied behaviour refers to a child occupying themselves by watching things around them, wandering around or playing with parts of their body. An onlooker describes a child who observes or talks to peers, but does not participate in play. Solitary independent play refers to playing alone and independently. The child engages with different toys to peers, yet is within speaking distance. Parallel activity involves independent play with toys that are similar to peers, without showing effort to be close to or participate in a group activity. Associative play involves engaging in a similar activity as others, while participating in conversation and sharing toys without organisation or assigned roles. The most complex level of play was defined as cooperative. This involves peers taking on a different role to achieve a common goal during play. In Parten's study (1932), each child demonstrated a range of levels of social participation, with the percentage of time spent at each level differing between children. Parten concluded that age was a determiner of the level of play and that younger children were more likely to play alone or in parallel than older children, who favoured more organised play. The large age range of participants does not allow for an understanding of social participation in play at specific developmental stages, but does provide a general description of the development of social participation in play across the early childhood years.

Play in Children with Autism.

Two key approaches have been used to examine play in children with autism. These include examination of play behaviours (Barton, 2010) and investigation of social participation with a play partner (Parten, 1932). These two aspects are defined below. They are then discussed in relation to their use in measurement of play in children with autism. An overview of the two approaches to evaluating play and the integration of these two aspects is presented in Figure 1.

It is proposed that the aspects of play included in these two approaches can be collated to provide a holistic description of the presentation of play in children with autism.

Play Behaviours (Barton, 2010):

- Functional and symbolic play
- Object use
- Sequencing
- Verbalisations

Proposed area to analyse play

Social Participation (Parten, 1932):

- Unoccupied behaviour
- Onlooker
- Solitary independent play
- Parallel activity
- Associative play
- Cooperative play
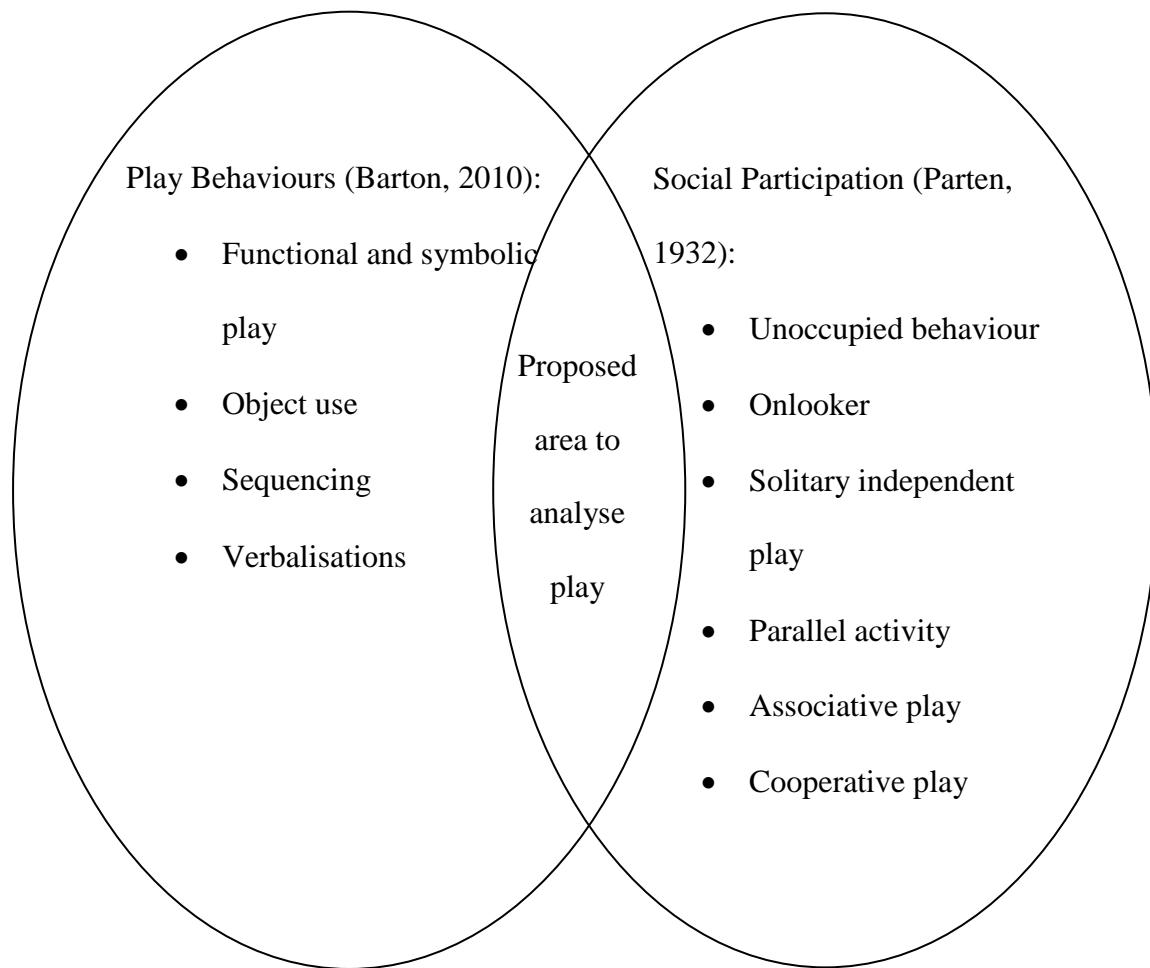
Figure 1. Two aspects of evaluating play

Play behaviours and children with autism. Play behaviours observed in children with autism are often described in the literature within the context of intervention strategies that address a deficit. Barton and Wolery (2008) reviewed the literature on intervention strategies used to teach play skills to children with autism. Studies that evaluated an intervention strategy, promoted pretend play through purposeful manipulation of the intervention, and recorded pre- and post- intervention data were included. Only 16 studies out of an initial 29 met criteria for inclusion, 14 of which were single-case studies. In addition to the dearth of multiple-case studies, Barton and Wolery (2008) concluded that assessment of the literature was made difficult due to the varied methods of defining play between studies. For example, the term 'pretend play' refers to different behaviours across studies, such as

pretend toy play and pretend self. In response to this conclusion, Barton (2010) widened the earlier review to include studies of children with disabilities other than autism. Studies that reviewed pretend play behaviours in children with a disability other than autism, provided a corresponding definition of play, used an experimental research design, and were published prior to 2010 were included. The author identified 37 studies, 27 of which included children with autism that met inclusion criteria. Again, definitions of successful play differed across the literature. Studies tended to examine either individual skills or types of play rather than evaluating the relationship between specific play behaviours and social participation during play. Such inconsistencies, and limited integration of different aspects of play, pose difficulties in evaluation of the research and its application to clinical practice.

In response to the varied approaches to describing play in the literature, Barton and Wolery (2008) proposed a taxonomy for defining and assessing play behaviours. This taxonomy was elaborated on by Barton (2010) and later applied to a case study by Barton and Pavilanis (2012). Play was categorised into two categories; functional play with pretence, and substitution. Substitution was further divided into three types; object substitution, imagining absent objects, and assigning absent attributes. Two characteristics of pretend play were then described by defining sequences and verbalisations. Although this taxonomy provides a consistent framework for defining and describing play behaviours, it does not extend to also define and describe the social participation aspects of play.

Functional and symbolic play in preschool-aged children with autism. Play can be categorised as functional or symbolic. Both functional and symbolic play differ in preschool-aged children with autism compared to typically developing peers and children with other developmental disorders. These differences are discussed below.

Previous research examines differences in symbolic play in children with and without autism. Wong and Kasari (2012) examined the play of 55, 3 to 5 year old children

and found that children with autism spent less time engaging in symbolic play than their peers with other developmental disabilities. Naber et al. (2008), however, did not find a marked difference between the percentage of time spent on manipulative, functional or symbolic play in 41 children with autism, aged 2 to 3 years, and those with other developmental disabilities. Findings indicate that differences in play may be more apparent with the emergence of symbolic play as children move from the toddler into the preschool years, as Naber et al. (2008) noted, symbolic play skills are not typically observed in children as young as those studied. Neither study compared observations to behaviours of typically developing children. Naber et al. (2008) collected data in a home environment, excluding the social aspect of play with peers. Whilst Wong and Kasari (2012) observed children in free play, the setting was an early intervention centre and did not involve interactions with typically developing children. The exclusion of typically developing peers in data collection means that play partners may also experience difficulties in engaging in play with peers. Results may therefore not accurately reflect how play would take place with typically developing peers.

Functional play in children with autism differs in frequency and quality to that of children without autism. Williams et al. (2001) sought to extend research into functional play and autism by developing sub-categories of functional play, based on the developmental progression of typically developing peers. This allowed them to assess the quality of functional play. The age range between groups was matched developmentally. Williams et al. (2001) concluded that, while there was no difference in the proportion of time children with autism spent engaging in functional play, the composition, or quality, of functional play differed to that demonstrated in both comparison groups. Children with autism predominately engaged in simple play acts involving manipulation of a single object and spent less time performing sequences of behaviours, such as drinking from one cup and then another cup,

than the other two groups. Additionally, their play involved more repetition and less diversity than that of the other children. This indicates that the quality of functional play in preschool-aged children with autism is atypical. Data was collected through observations of participants playing at home, hence the lack of measurement of the social aspect of play with peers in this study.

Symbolic play is more complex than functional play and involves pretence (Kasari, Chang, & Patterson, 2013). Jarrold (2003) reviewed the literature on symbolic play in children with autism and concluded that deficits in symbolic play are based on abnormalities of development rather than a delay in the development of symbolisation per se. This conclusion was supported by Thiemann-Bourque, Brady, and Fleming (2012), who compared the symbolic play of 38 children with developmental disorders and 38 children with autism, aged 3 to 5 years old. The researchers did not observe a difference in the frequency of symbolic play between the two groups. Rather, the quality of symbolic play differed. Further studies describing the differences in the way play takes place between children with autism and typically developing peers rather than solely calculating its frequency, are needed to comprehensively describe play in preschool-aged children with autism.

Object use during play in preschool-aged children with autism. The use of objects in play is a critical component in defining and describing both functional and symbolic play in preschool-aged children with autism. Preschool-aged children with autism engage in less varied and more repetitive object use during functional play than typically developing children (Williams et al., 2001; Williams, 2003). This difference becomes apparent from an early age. Williams (2003) reviewed the literature on solitary object-exploration and functional play in typically developing children and children with autism in the first 14 months of life. Using a retrospective study design, either in analysing home videos or parent questionnaires, Williams (2003) concluded that children with autism demonstrate unusual

patterns of exploratory play when compared to typically developing children. For example, children with autism were described as becoming preoccupied with an object or part of an object. These findings are consistent with repetitive and restricted behaviour diagnostic criteria of autism.

In addition to outlining unusual use of objects during play, differences in uses during functional play are also discussed in the literature. While research indicates that school-aged children with autism use object substitution during prompted pretend play more than spontaneous pretend play (Charman & Baron-Cohen, 1997), object substitution skills in preschool-aged children with autism remain unclear. Lewis and Boucher (1995) examined the use of toys by 45 children, including children with autism, learning difficulties, and typically developing children. The age of participants with autism ranged from 6 years, 6 months to 11 years. Participants were given instructions to carry out play acts with a car and a doll, as well as to generate their own play acts. Children with autism showed impairment in producing symbolic acts with the car, but not the doll, in comparison to typically developing peers. Lewis and Boucher (1995) proposed that the moveable doll parts provided cues in generating play movements, while the fixed nature of the car required more symbolic play skills to generate play actions. Additional research describing in way preschool-aged children with autism use objects during pretend play with typically developing peers is needed. Such information can contribute to clinical reasoning when planning intervention targeting play in preschool-aged children with autism.

In addition to examining difference in toy use, differences in toy preferences have been identified in the literature. Dominguez, Ziviani, and Rodger (2006) compared object preference in 24 children, aged 3 to 7 years, with autism and 34 typically developing children in a clinical play environment. The researchers presented a selection of toys for fifteen minutes. Engagement with each toy was recorded at 10 second intervals. Children with

autism played significantly less with construction toys, dolls and 'house' toys and significantly more with Thomas the Tank Engine theme toys, gross motor toys, infant toys, dress-up accessories, action figures and plastic animals than their typically developing peers. Thiemann-Bourque et al. (2012) also examined the diversity of interest in different toys in children aged 3 to 6 years. In contrast to Dominguez et al. (2006), the authors found no significant differences in expressed interest in playing with different toys or diversity of object play in children with and without autism. This may be because the latter study compared toy choices to those of children with developmental disorders rather than to typically developing children. It is therefore possible that developmental factors as well as autism contribute to toy preferences. Neither study was conducted in a natural environment and neither study indicated if toys were used as they were intended or if a higher level of object substitution occurred. Additionally, neither study measured the impact of interests and toy selection on social participation. Examining selection of play activity during play with typically developing peers would provide valuable understanding of how children with autism engage in play in a natural setting. Such information could guide the selection of play materials during intervention for children with autism playing with typically developing peers.

Verbal behaviours and play sequences in preschool-aged children with autism. Researchers have stressed the importance of verbalisations during play (Barton & Wolery, 2008; Barton, 2010). Development of language skills is positively correlated to the development of sequencing skills in play (Kasari, Gulsrud, Freeman, Paparella, & Hellemann, 2012), however, the exact relationship between language and play in children with autism remains uncertain (Manning & Wainwright, 2010). Kasari et al. (2012) concluded that children with autism who demonstrate simple sequences of joining play acts together at age 3 to 4 years are more likely to demonstrate use of functional language by 8 to

9 years. Kasari et al. (2012) conducted a 5-year longitudinal randomised control trial to examine the impact of intervention targeting play skills and joint attention on language and cognitive outcomes for 40 children with autism aged 3 to 8 years old. Participants received intervention targeting either joint attention or play skills. Both groups showed improved spoken language outcomes. It must, however, be noted that language was assessed through a measure of vocabulary, which does not provide a holistic picture of functional language use in conversation or in play.

Language deficits are positively correlated to play deficits in children with autism, but are not the sole factor in determining the nature of this deficit. Manning and Wainwright (2010) conducted a study of 30 children aged seven to nine with autism and 33 children with developmental language disorder to assess the level of play skills used when children were matched in their expressive language abilities. Children with autism demonstrated fewer higher level interactions than children with language disorder. Additionally, Thiemann-Bourque et al. (2012) found that play correlated to language and cognitive levels, but that this correlation was not specific to autism. These studies included participants with a cognitive impairment and therefore findings do not necessarily apply only to children with autism.

Recognising the need for research focusing on how language use is specifically related to play in preschool-aged children with autism, Bauminger- Zviely, Karin, Kimhi, & Agam- Ben- Artzi (2014) sought to examine and compare the spontaneous conversation of children aged 3 to 6 years old. Twenty-seven children with a diagnosis of High Functioning Autism were compared to 30 typically developing children. Additional peers were identified as friends or not friends of the participants by teacher and mother reports. Quality of conversation was given a global evaluation based on a five-stage Likert scale to evaluate appropriateness of utterances, assertiveness and responsiveness. The authors calculated higher conversational abilities in typically developing children than in children with autism.

Interestingly, children with autism demonstrated a higher level of pragmatics and conversational skills with friends than non-friends, indicating the importance of friendships in social interactions. Describing the impact of verbalisations of children with autism during play on social participation with typically developing peers could guide intervention targeting communication skills to support social interactions during play.

Play sequences demonstrated by children with autism are described briefly in the literature in relation to initiating and continuing play interaction with a play partner. Freeman and Kasari (2013) examined play sequences of 16 children with and without autism for 10 minutes in free play with their parents. Participants were matched by developmental level rather than age. The mean age of children with autism was 49.5 months. The mean age of typically developing peers was 28.5 months. Parents of children with autism showed a higher frequency of initiating play sequences and suggesting play acts when playing with their child than parents of typically developing children. Also, parents of children with autism were more likely to respond to play acts with a higher level play act, as opposed to parents of typically developing children who were more likely to match or expand their child's play at the same level. Parent imitation was positively correlated to longer sequences of play. In this study, it is suggested that play behaviours of a child with autism impacts on the behaviour of an adult play partner and affects the subsequent sequences of play. Little is known about sequences of play between preschool age children with autism and their typically developing peers. Investigation into sequences of play between children with autism and typically developing preschool-aged children would help determine if similar differences are noted and would be useful in understanding the social interactions between children with autism and peers during play.

Social participation and play in preschool-aged children with autism. There is a positive association between the development of complexity of play and social participation.

McAloney and Stagnitti (2009) investigated the relationship between object use during play and social peer play in 4 to 5 year old typically developing children who had not yet begun school. The authors concluded that children who have elaborate play skills with both conventional and unconventional objects and who use object substitution in play are more socially interactive with peers than those who don't demonstrate such high levels of play. Conversely, children who showed difficulty in object substitution, using objects to represent other objects in play, were more likely to be socially disruptive. McAloney and Stagnitti (2009) concluded that a child's ability to play with conventional toys has a strong relationship to social skills and that targeting complex symbolic play sequences with conventional toys will positively affect a child's ability to engage in social play with peers. Similar conclusions were drawn by Uren and Stagnitti (2009) when examining children aged 5 to 7 years. They found that children with proficient symbolic play skills show more competent social interactions with peers than those with less competent symbolic play skills.

Play in children with autism is characterised by differences in social skill development. In a review of the literature focusing on social play in children with autism, Jordan (2003) reported that children with autism demonstrate fewer adjustments to their behaviour to include others and experience fewer play interactions with others. Social participation of children with autism during play is examined in this section.

Despite the extensive use of Parten's (1932) hierarchical scheme of social participation in play in early childhood education, few studies have examined this aspect of play in children with autism. Stirling and Douglas (2012) sought to describe participation during pretend play in five young children with autism. Set in the child's home, interactions in the child's home between the children, aged 3 to 7 years, and their mothers were examined. Stirling and Douglas (2012) noted that children with autism showed a preference for child-directed interactions. The relationship between children with autism and peers is

unique and cannot be fully replicated by an adult (Wolfberg, Bottema-Beutel, & DeWitt, 2012). There is therefore a need to extend this study to include peer interactions.

Other studies have examined social participation during play through calculating the frequency of social interactions. Gutierrez, Hale, Gossens-Archuleta, and Sobrino-Sanchez (2007) compared the number of social interactions initiated by three 4 to 5-year-old children with autism and directed towards their typically developing peers in an inclusive early childhood centre. They found that staff rarely facilitated play among the children, and children with autism rarely engaged in social interactions with peers. Results were based on recording the percentage of one minute intervals in which a target behaviour occurred. Target behaviours were defined as vocal, gestural, or physical initiations. Initiations by typically developing peers towards children with autism ranged from only 0%-4% of 1-minute intervals. Initiation of social interactions made by children with autism ranged from only 0%-1% of one minute intervals, except for one participant who was observed engaging in physical initiations 12% of the recorded time. The nature of these interactions was not described further, so the level of social participation associated with the physical initiations is not known. The target participants had significant expressive language difficulties and only used single-word utterances. Results may therefore not apply to children with autism who have a higher level of expressive language. Though a small sample size, a rare account of the use of play skills of children with autism in a natural setting with peers is provided and an important factor in understanding play in autism is outlined; that of limited engagement with peers in an inclusive setting without adequate support. However, details of play are not described.

In addition to identifying differences in the frequency of social interactions in children with autism, differences in the frequency of more mature social participation during play have been identified. Jahr et al. (2007) investigated social participation by calculating

the frequency and latency of parallel play, cooperative play and social interactions in 23

children with autism and 17 typically developing children aged 3 to 7 years for 3 months in a

mainstream kindergarten. The presence or absence of a parallel, cooperative, or associative

play behaviour was recorded at 3 minute intervals. Jahr et al. (2007) concluded that children

with autism show significantly less frequency of social interactions during play than typically

developing peers. The natural context of this study makes it a valuable resource in

understanding play. However, parallel, cooperative, and associative play were not specified

in the data analysis. As a result, data describing the relative amounts of parallel, cooperative,

and associative play and social interactions was not reported. A more detailed description of

social participation during different types of play in participants across a smaller age range

could increase understanding the characteristics of play in preschool-aged children with

autism and guide future intervention.

      Social participation during play in children with autism is characterised by

differences in both social behaviours and social participation. Anderson, Moore, Godfrey,

and Fletcher-Flinn (2004) observed the social behaviours and social participation of 10

children, aged 3 years, 4 months to 7 years, 7 months old, with autism in mainstream early

childhood and primary school playgrounds. Social participation was categorised from an

adaptation of Parten's (1932) description and verbal and nonverbal social behaviours were

identified. The number of initiations a child with autism made towards another child or adult,

and the number of initiations by others towards the child with autism was recorded. Anderson

et al. (2004) concluded children with autism engage in less mature play behaviours and less

socially complex play than their typically developing peers. Set in a natural environment with

typically developing peers, Anderson et al. (2004) present an important description of the

differences in social behaviours and social participation between children with autism and

typically developing children. However, the specific behaviours that resulted in increased

social participation were not identified. Research determining behaviours that result in more mature social participation is needed to identify intervention goals addressing these differences.

Challenges and Gaps in the Literature

Studies utilise a range of definitions and measurements when examining play and do not integrate all aspects of play to present a description in a natural context. The numerous definitions of aspects of play have resulted in inconsistent analysis of play in preschool-aged children with autism. Specific behaviours used during play are identified separately, and do not describe social participation in conjunction with play behaviours. Of note is the limited amount of research that records responses of typically developing peers to play behaviours as a measure of successful play.

In addition to examining different aspects of play, the age, cognitive, and language skills of participants varies across studies. Due to the heterogeneity of deficits in autism, research examines play in preschool-aged children with autism with a range of cognitive (Bauminger-Zviely et al., 2014) and language (Kasari et al., 2012) abilities. Additionally, the age range included in studies of "preschool-aged children" varies between 3 and 5 years (Williams, 2003; Gutierrez et al., 2007). Due to the paucity of studies, this literature review has examined research across the spectrum of cognitive and language abilities of children 6 years old and younger, as this is the age children may be before enrolling in school.

There are a limited number of studies examining preschool-aged children with autism engaged in play with typically developing peers in a natural context. Studies have observed children with autism engaged in play with an adult (Freeman & Kasri, 2013; Wu & Chiang, 2014), or during solitary play (Williams, Reddy, & Costall, 2001), rather than with peers. While some studies examine play in preschool-aged children with autism within a natural context with typically developing peers (Gutierrez et al., 2007), the majority take

place in an early intervention (Wong & Kasari, 2012) or clinic environment (Dominguez et al., 2006). Studies most relevant to the proposed research project are outlined in Appendix A. Given this gap in the literature, the focus of this research project is behaviours in 4 to 5 year old children with autism and the continuation of play with typically developing peers in an inclusive early childhood setting.

Research Questions

In response to the gaps in the literature presented above, the following primary research question was proposed:

- What behaviours do young children with autism display during play with their typically developing peers in an early childhood setting?

The following secondary research question was proposed:

- What is the participants' teacher's perception of behaviours young children with autism display during play with their typically developing peers in an early childhood setting?

Methodology

Summary of Methodology

Implementation of this research project began with ethical approval from the Griffith University Ethics Committee. Participants were then recruited via distribution of information sheets through early childhood centres and allied health professionals in Sydney's inner western and eastern suburbs. Four children with autism, aged 4-5 years old, and their teacher, were recruited to participate.

Two key phases of data collection took place, including (1) semi-structured interviews with participants' teacher and (2) descriptions of observations of play in children with autism during play with typically developing peers. Interviews in phase 1 were transcribed and key themes addressing the perception of the teacher of play in children with autism were identified through thematic analysis. Data collected in phase 2 was analysed in two ways. First, thematic analysis of descriptions of play behaviours used by children with autism was conducted. These behaviours were then examined in their relation to play with typically developing peers continuing, terminating, or refocusing on a different play activity. Second, quantitative data was collected to identify social participation during play by calculating the frequency of parallel, associative, and cooperative play exchanges with typically developing peers. Data analysis of phase 1 and phase 2 were then synthesised, as data provided by the teacher in phase 1 provided contextual information for observations described in phase 2. Finally, results were reported to address the research project's primary and secondary research questions. Results from each phase are reported separately below. Synthesis of the two phases is reported in the discussion below. A summary of the method and purpose of each phase, and the research question addressed, is outlined in Table 1. An overview of the research methodology is outlined in Figure 2.

Table 1

Overview of Data Collection and Analysis

	Research method	Data analysis	Purpose	Research question addressed
Phase 1	Semi-structured interview with each target child's teacher	Thematic analysis	To plan the setting, data collection, and coding for the subsequent research phase. To gather data on the target child's teacher's perception of their preference of play activities and preference of play partners, use of play behaviours, and effect of play behaviours on play with typically developing peers. To analyse the teacher's perception of play behaviours of children with autism that lead to successful play with typically developing peers. To provide further insight into the reasons behind behaviours and responses from peers observed in phase 2.	What behaviours do young children with autism display during play with their typically developing peers in an early childhood setting? What is the participants' teacher's perception of behaviours young children with autism display during play with their typically developing peers in an early childhood setting?
Phase 2	Observation of play of preschool-aged children with autism with typically developing peers	Thematic analysis of descriptive data Quantitative analysis of social participation during play	To gather and analyse data on which play behaviours continue, refocus, or terminate play with typically developing peers. To gather and analyse data on the social participation of children with autism with typically developing peers.	What behaviours do young children with autism display during play with their typically developing peers in an early childhood setting?

Preparation

Ethical Approval

Participant recruitment: Four children with autism, aged 4-5 years old and their teacher

Data collection and analysis

Phase 1: Semi-structured interview with teacher

Thematic analysis of interviews

Phase 2: Observation of children with autism playing with typically developing peers

Thematic analysis of play behaviours

Quantitative analysis of social participation with peers

Synthesis of phase 1 and phase 2 data
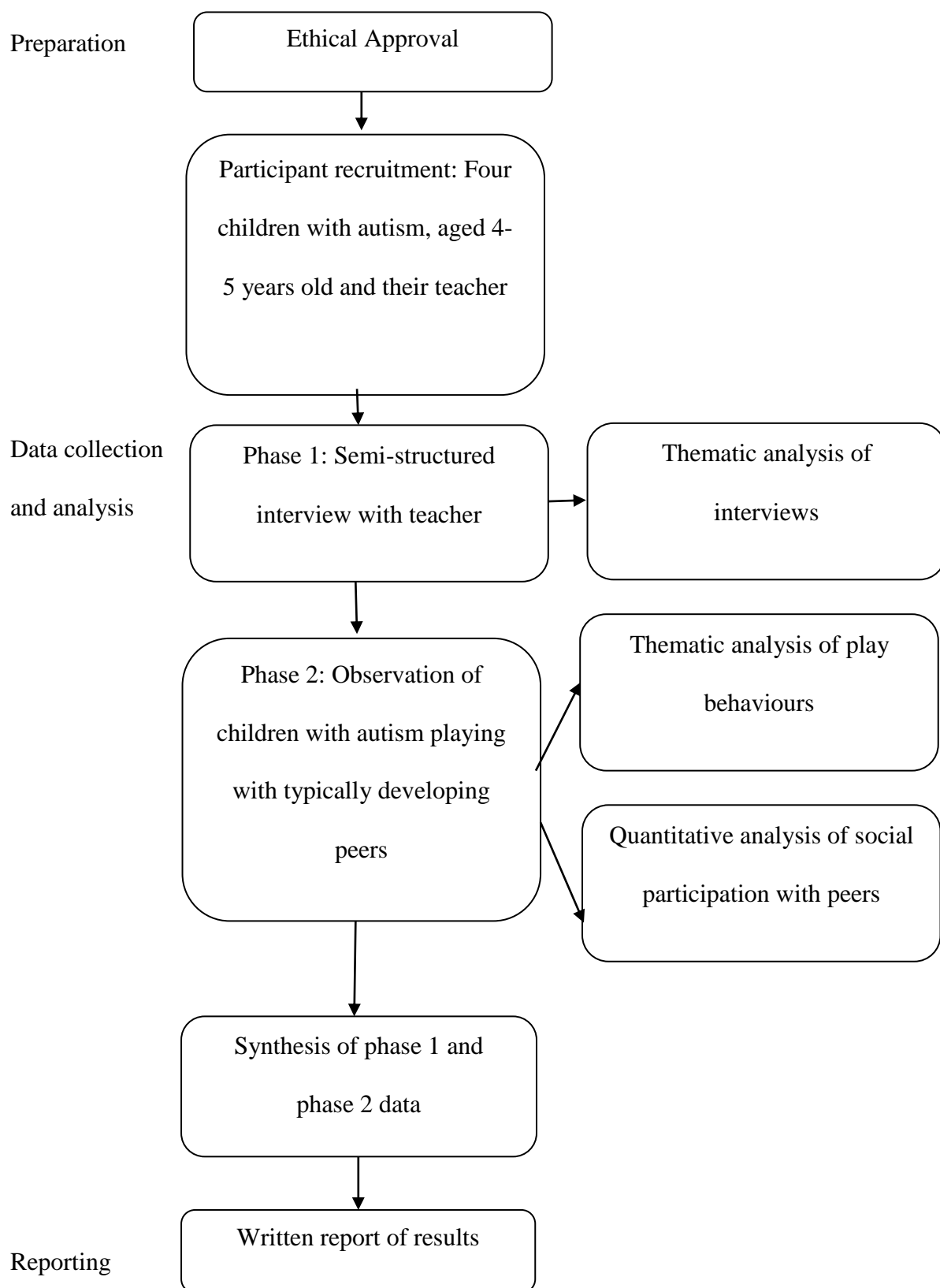
Written report of results

Reporting

Figure 2. Overview of research methodology

Research Design

Congruent with a pragmatic worldview, mixed methods research involves utilising data from both quantitative and qualitative research to gain a more comprehensive understanding of the research topic than would be provided from a single methodology. This project utilises a mixed methods methodology, characterised by a sequential design. Sequential design has been described by Fetter, Curry and Creswell (2013) as the integration of quantitative and qualitative data in a mixed method design as occurring at a design, methods, and reporting level. Integration at the design level occurs as each phase of the study informs and builds on the subsequent phase. Integration at a methods level occurs through linking the methods of data collection through connecting, building, merging, and embedding. Integration at the interpretation and reporting level involves analysing and presenting findings from both quantitative and qualitative research.

Integration at a design level occurs at each of the two phases. As seen in Figure 2, the first phase sets the stage for the subsequent phase. Integration at a methods level occurs through building; that is, data collection from Phase 1 informs the data collection approach in Phase 2. For example, preferred play activities identified in Phase 1 were included in the sample of activities to be observed in Phase 2. Integration through merging of data brings data together for analysis and comparison. This is most prominently seen between Phase 1 and 2, where the teacher's perceptions of play of children with autism and observations of children with autism are compared.

In this research project, an inductive approach to data collection and analysis was used. This bottom-up approach starts with a research question and develops conclusions from the data without predetermined hypotheses (6 & Bellamy, 2014). As outlined in Table 1, thematic analysis of semi-structured interviews was conducted without a predetermined hypothesis of themes that would emerge. Similarly, descriptive data of observations of play

was collected and then coded, rather than recording the presence or absence of predetermined behaviours.

Participants

Selection criteria of participants. Four children with autism, three males and one female, and their teacher, participated in this study. Child participants were aged 4 to 5 years old and were starting school in the subsequent year. They had functional use of verbal language at sentence level, meaning that they verbally express their basic needs and wants with a range of communication partners in complete sentences. Additionally, they needed to demonstrate functional use of objects in play to be included in the study. A teacher for each participating child was required to be available to participate in a semi-structured interview. Teachers were required to have taught the child participant for a minimum of 3 months prior to the initial interview and have a minimum qualification of a Bachelor degree in the field of education.

Recruitment of participants. A list of early childhood education centres in the inner western and eastern suburbs of Sydney was compiled from local council websites and Yellow Pages online phone directory. Additionally, allied health professionals working with children with autism were contacted to widen the search for participants with autism. A list of allied health professionals in the same geographical area who are providers of the Australian government Helping Children with Autism services was compiled from the Department of Human Services directory. A cover letter (Appendix B), requesting assistance in recruitment was sent along with consent forms and information sheets outlining the research project's requirements. Separate information sheets were given to teachers and caregivers, and consent to participate in the research project and to audio record any interviews was obtained in the form of a signed document (Appendix C – F).

Follow-up phone calls were made to early childhood centres and allied health professionals until four eligible participants had applied. Participant selection was finalised after the teacher provided consent to also participate in the study and approval was gained from management of the early childhood centre involved. Four children were recruited from one early childhood centre. One teacher who was familiar with all child participants was recruited.

Assessment of child participants. Assessment of child participants was conducted to provide a description of participants. Such information can determine to what extent the participants are typical of children with autism. Basic demographic information was collected from caregivers and the teacher. Assessment tools were chosen to provide a holistic description of the participants' language, adaptive, and social-communication skills. Demographic and assessment details are summarised in Table 2. Diagnosis of autism was confirmed via diagnostic reports, either viewed by the researcher or the child's teacher. These reports indicated that children were assessed by a paediatrician using DSM IV or DSM 5 in a multidisciplinary team. The Social Communication Questionnaire (SCQ: Rutter, Bailey, Lord, & Berument, 2003) was completed by the teacher for each participant. The SCQ is based on the Autism Diagnostic Interview-Revised (ADI-R) (Eaves, Wingert, Ho, & Mickelson, 2006) and can be used as a first-level screening tool for autism (Chandler et al., 2007). The SCQ was used to obtain information on participants' social communication skills. Participants' scores are presented in Table 2. A score of 11 or greater indicates difficulty in the area of social-communication skills. Two participants, Kevin and Vincent, scored within this range. The remaining two participants (Sam and Rebecca) achieved low scores. This indicates that, despite all participants having a diagnosis of autism, two participants were identified by the teacher as having poor social communication skills, whilst two participants were perceived as having more developed social communication skills. As the SCQ was

completed by the participants' teacher, results from this assessment provide a description of how the teacher perceived their social communication skills.

The Vineland Adaptive Behavior Scales, Second Edition (Sparrow, Cicchetti, & Balla, 2005) was completed by the child participant's teacher. The assessment measures adaptive behaviours in the domains of motor skills, communication, daily living, and socialisation. Participants' scaled scores are presented in Table 2. A scaled score between 86 and 115 is considered "Adequate." A scaled score between 70 and 85 is considered "Moderately Low." Participants presented with a mixed profile across domains, with scores moderately low to adequate.

Table 2

Participant Information

	Age at commencement of Phase 1 (Year; Month)	Gender	SCQ score	The Vineland Adaptive Behavior Scales, Second Edition Domain Standard Score			
				Communication	Daily living skills	Socialization	Motor skills
Sam	5;3	Male	7	93	82	85	99
Kevin	5;0	Male	11	86	84	90	72
Rebecca	4;5	Female	2	105	104	107	78
Vincent	5;8	Male	16	84	82	87	88

Procedure and Analysis

The research project consisted of two phases. Data collection procedure and analysis for each phase is outlined below.

Phase 1 procedure and analysis.

Phase 1 procedure. Four interviews were scheduled in consultation with the childcare provider's manager and teacher via email. The interviews were 25 to 45 minutes duration. Each interview focused on a different child. Interviews were digitally recorded on two hand-held devices. Each audio recording was then transcribed by the researcher into a separate Microsoft Word document. Speech fillers were not included in the transcripts. Digital recordings were deleted at the completion of the research project in accordance with ethical guidelines.

The intimate and flexible nature of this semi-structured interview makes it possible to explore subtleties and complexities (Anderson et al., 2010). It is designed to gain an understanding of the participants' experiences and attitudes, and why certain actions occur (Harvey-Jordan & Long, 2001). Open-ended questions were designed to gather data relevant to the project's research questions. Open-ended questions provide the opportunity to gather information without restricting the teacher's answers. The interviews remained flexible, allowing the participant to introduce new themes (Harvey-Jordan & Long, 2001). Key questions were identified and additional probe questions were formulated and used if further information was needed. Opportunity to add additional comments on the topic was provided after the interview. Examples of interview questions and their relationship to the research project are outlined in Table 3. In line with conduct of a semi-structured interview, these questions acted as a guide in the interview process rather than being adhered to as a rigid script. At the request of the teacher, a written copy of the researcher's questions was provided for the teacher to refer to during the first interview, and to review prior to discussion about

the remaining three participants. Relevant follow-up questions, supportive nods and vocalisations, restatement, and clarification were employed to encourage disclosure of information (Partington, 2001).

The interview served four purposes to inform the research. First, it provided information on the optimal setting for Phase 2 of data collection. For example, details of play partners most likely to engage in play interactions with the child with autism, identification of toys likely to optimise play interactions, and discussion of the time of day to attend the early childhood centre, were used to plan the logistical components of Phase 2. Second, data were used to help to predict behaviours to be observed and coded. Third, data were gathered to investigate the way teachers consider children with autism engage in successful play with peers. Fourth, due to their extended relationship with the child participant and peers, teachers can provide further insight into the reasons behind observed behaviours and responses from peers. For example, the teacher can provide some background details about why the child with autism or peer chose to act in a particular way.

Table 3

Semi-Structured Interview Questions

Interview questions	Additional probe interview questions	Area of focus
What is the best context to observe (name) engage in play with peers?	What toys and games does (name) like to play? Who does (name) spent most of his time playing with? Are there any specific toys or games that (name) plays that lead to playing with peers? What time of day does (name) show the best play skills?	Setting up the environment for describing play behaviours of young children with autism in an early childhood setting
What actions does (name) do to get peers to play with him/her?	Can you describe some behaviours that help (name) join in a game with other children? What behaviours does (name) use to stay involved in a game with peers? How does (name) use objects during play What role does (name) usually play in the group when playing with peers? What skills does (name) show that helps him play? What do you think would help (name) engage in play with other students? What kind of toy usage engages peers to play with (name)?	Teacher's perception of play behaviours of young children with autism

Interview questions	Additional probe interview questions	Area of focus
What actions do you believe have the most positive impact on peers engaging in play with (name)?	How do other children respond to (name)'s attempt to play with them? What behaviours do you believe will help (name) play with peers? What you see as important skills and behaviours a child needs to play successfully with peers?	Teacher's perception of how play behaviours of young children with autism impact on social interactions with peers
What actions does (name) do to get peers to play with him/her for a sustained period of time?	What behaviours do you observe results in other children playing with (name)?	Teacher's perception of how play behaviours of young children with autism impact on social interactions with peers
What actions does (name) do that you believe prevent peers from playing with him/her?	What behaviours do you observe result in other children moving away from (name)?	Teacher's perception of how play behaviours of young children with autism impact on social interactions with peers

Phase 1 analysis. An inductive approach to data coding and analysis was used. Analysis was limited to data that addressed the proposed research question. Thematic analysis followed the six phases outlined by Braun and Clarke (2006), including familiarisation of data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing a report. Only parts of the interviews pertaining to the research questions were transcribed. Transcribing audio recordings assisted the researcher in becoming familiar with the data. Transcriptions were read multiple times while descriptions of the data were written next to the data. This assisted the researcher to become immersed in the data and identify initial codes. Themes pertaining to the research questions were then identified from the initial codes. Themes were reviewed and revised in conjunction with the research team to ensure consensus and agreement. Following consensus of the identification of themes addressing the research questions, themes were further defined and named before a final report was produced. Examples of codes relating to each theme were highlighted to be included in the research project's final report. Coding sheets can be seen in Appendix G.

Phase 2 procedure and analysis.

Phase 2 procedure. Direct observation was utilised as it was predicted to be more effective than audio-visual recordings, as participants and peers were highly mobile and this would require multiple cameras to record data. It was also decided that excessive recording devices would be obtrusive in such an uncontrolled natural setting. Furthermore, ethical clearance required to record peers was not logistically practical. A second researcher collected data simultaneously for four out of 12 of the observation sessions for reliability purposes.

Observation sessions were scheduled for each participant in conjunction with the child's teacher after the semi-structured interviews outlined in Phase 1. Information gathered

in the first phase of data collection was used to schedule observation times to ensure that the environment observed elicited as many positive play behaviours as possible.

Each child was observed three times for 40 minutes engaging in free-play with typically developing peers at the participant's regular childcare centre during scheduled indoor and outdoor free-play. The researchers collected descriptive data from a distance close enough to observe play interactions, but not interfere. Whilst the purpose of this study is to examine play in a child's natural setting, some adjustments were made to optimise the child's ability to demonstrate their repertoire of successful play skills. For example, children had access to preferred toys identified by their teacher. As children were free to choose the play activity they wished to engage in, there was some degree of repetition of play activities between observation sessions.

Data collected followed an Antecedent-Behaviour-Consequence chart in order to and descriptively record the child with autism's behaviour (Antecedent), response from peer (Behaviour), and if the initial behaviour and peer response resulted in the child participant's engagement in the play activity with peers continuing, being refocused to a different play activity, or terminating (Consequence). Descriptive data of play behaviours of children with autism during parallel, associative, and cooperative play with typically developing peers was recorded electronically on a prepared data collection sheet by a researcher during observations. A data collection sheet template can be seen in Appendix H.

Both verbal and nonverbal behaviours were descriptively recorded. The researchers attempted to describe all behaviours observed, including gesture, proximity, the way toys were interacted with, and verbalisations. Verbal and nonverbal behaviours observed during parallel, associative, and cooperative play were descriptively recorded in as much detail as possible, verbalisations were not necessarily recorded verbatim. Instead, the function, or purpose, or the verbalisation was recorded. For example, rather than recording a comment

verbatim, "comments about picture" was recorded. Examples of functions of verbalisations are outlined in the data collection sheet in Appendix H.

The 'Consequence' was defined as 'continued,' 'refocused,' or 'terminated,' 'Continued' refers to the child with autism continuing to engage in the same play activity in parallel, associative, or cooperative play with peers. 'Refocused' refers to the child with autism continuing to engage in parallel, associative, or cooperative play with peers, however indicates that the play activity changed to a different activity. 'Terminates' indicates that the child with autism no longer engaged in parallel, associative, or cooperative play with peers.

Additionally, the social participation of the child participant with a peer during an interaction was recorded as either parallel, associative, or cooperative. Play that only involved adult interactions was not analysed. Definitions of social participation are outlined in Appendix H as part of the research project's data collection sheet.

Phase 2 qualitative and quantitative analysis Data was analysed both qualitatively and quantitatively. Qualitative thematic analysis was undertaken following the same steps outlined by Braun and Clarke (2006), as described in Phase 1. Familiarity of the data was achieved through transferring written notes onto Microsoft Word and reading the data multiple times. Initial codes were generated by recording the function of behaviours. These were then grouped into recurring themes. These themes were repeatedly refined by consolidating themes into fewer themes. The process was overseen by the research team to ensure accuracy. Frequency of codes were calculated using an Excel spreadsheet. This process helped to identify which behaviours were more frequently recorded and assisted the process in which recurring themes were identified. Themes were defined and named. The process was repeated until key themes had emerged. Finally, results were reported through written discussion of each key theme.

Quantitative data was collected by recording social participation in play in each Antecedent-Behaviour-Consequence sequence. The frequency of parallel, associative, and cooperative play sequences was recorded and the percentage of each was calculated.

Inter-rater reliability. Five hours training of an additional rater occurred prior to Phase 2 data collection. As well as training the second rater, this process allowed definitions of behaviours and data collection methods to be refined prior to data collection. Training involved a verbal explanation of the observation requirements as well as a written description of behaviours to be observed. These descriptions are outlined on the observation sheet in Appendix H. Practice observations occurred by viewing children during play at a daycare centre familiar with the researcher. Children observed during practice sessions did not have a diagnosis of autism. No identifiable data was recorded. Data recorded during these practice sessions was disposed of after the practice sessions. Permission was obtained by centre management via telephone and email correspondence. A letter informing centre management and caregivers of children in the centre of the researcher's presence was distributed to caregivers via the centre manager. The information letter can be seen in Appendix I. Caregivers were invited to contact the researcher for further details and could 'opt-out' of their child's actions being recorded.

Inter-rater reliability was conducted on four out of the twelve observation sessions, resulting in a total of 313 play acts being coded by two observers. Inter-rater reliability was analysed by Cohen's Kappa on R (version 3.3.1) with the irr package (version 0.84). The Kappa was 0.864, which corresponds to substantial agreement between the two observers.

Ethical considerations. Ethical approval was obtained from the Griffith University Ethics Committee prior to beginning recruitment of participants. A copy of a statement of approval can be seen in Appendix J.

Several sensitive components that required additional attention are included the research project. Studying minors with a disability requires care. No harm was predicted to occur from this research project, however informed consent and maintaining confidentiality are two factors that needed to be considered. As participants were minors, consent was obtained from children's caregivers following a written description of the research project and requirements of participation. Further information was provided if requested. Participants were informed that researchers were watching them play. No objections were noted. No identifiable data was reported outside of the research team. For example, in the presentation of results, children are identified with a pseudonym rather than by their name, their age is presented in years and months rather than date of birth, and the name of early childhood centre involved remains confidential. Consent forms containing identifiable information were stored securely by the researcher. Data collected focused on the child participants with autism, rather than peers. No identifiable data was collected from peers at the participating early childhood centre. A letter informing caregivers of the researcher's presence at the centre was distributed to caregivers via the centre manager. The information letter can be seen in Appendix K. Caregivers could 'opt-out' of their child's actions being recorded. The nature of the disorder being examined was not identified to retain confidentiality for child participants. Parents were invited to contact the researcher for further details.

Results

Thematic Analysis of Interviews with Teacher

Data gathered initially provides an insight into the way the participants' teacher perceives their play skills, and provides context for data collected in the next phase of this research project. Thematic analysis of each interview revealed six key themes across the four interviews. Key themes are (1) special interests and skills, (2) physical activity, (3) role of peers, (4) conflict management, (5) verbal behaviours, and (6) enjoyment. Subthemes were generated for each key theme. Definitions of key themes and sub-themes are outlined in Table 4. Examples of each sub-theme can be seen in Appendix G.

Table 4

Definitions of Key Themes and Sub-themes of Interview Transcripts

Theme	Definition of Theme	Sub-theme	Definition of Sub-theme
Special interests and skills	A special interest refers to a child's preferred activity or topic. A special skill refers to a skill in which the child shows competency.	Opportunities for interaction	Special interests or skills as a focal point for social interactions.
		Obsessions	Special interests or skills as detrimental to social interactions.
		Limited social resources	Using special interests and skills as the primary means of engagement can restrict other engagement.
		Facilitating friendships	Special interests and skills facilitate the formation of friendships and choice of play partners
Physical activity	The use of physical movement during play.	Physical activity in social play	The use of physical activity to enhance a child's social play interactions.
		Accessibility of physical activity	The impact of the environment to promote and allow for physical activity to be part of social play.

Theme	Definition of Theme	Sub-theme	Definition of Sub-theme
Role of peers	The role of peers in social play interactions.	Preference to lead or follow	A child's preference to either direct a play interaction or follow another child's lead.
		Peer-teaching	Participants observe and imitate peers to acquire new play skills and engage in social play.
		Initiating interactions	The role of peers to initiate and maintain a social interaction during play.
Conflict management	The impact of conflict on social play interactions.	Sharing	Conflict around sharing space and materials with peers during play.
		Problem solving	Difficulty generating and implementing effective strategies to respond to social difficulties during play.
Verbal behaviours	The use of verbal communication during play.	Verbal success	Verbal communication skills as a determiner for successful play interactions with peers.
		Verbal value	Verbal communication skills as highly valued for evaluating a child's ability to engage in social play.
Enjoyment	The emotional reward experienced during play	Enjoyment in play	The interaction between enjoyment of social play and children's own interests.

Special interests and skills. The impact of participants' special skills and interests on play interactions with typically developing peers was discussed across all four interviews. Special interest refers to a child's preferred activity or topic. A special skill refers to a skill in which the child shows competency. Sub-themes identified include (1) opportunities for interaction, (2) obsessions, (3) limited social resources, and (4) facilitating friendships. Both positive and negative effects on initiating and continuing peer interactions during play were discussed by the teacher.

Shared interest in a play activity was described as creating opportunities for interaction. The teacher reported that peers would join the participant if the participant was playing with something that they also enjoyed playing with. She stated, "eventually, who has similar interests, will join in. And this is how it goes and then they play. [SIC]" A shared interest was therefore identified by the teacher as the catalyst for play interactions with typically developing peers.

Despite creating opportunity for interaction, the teacher also associated special interests and skills with obsessions, and described them as an obstacle to engaging in social play with peers. The teacher elaborated on the restrictive nature of relying on special interests to attract peers by outlining how the use of special interests and skills is a successful, yet limited social resource. Whilst a shared interest was perceived to help initiate a play interaction, over-reliance on this as a means of continuing to engage in social play was problematic as it relied on all peers maintaining interest in an activity for the social interaction to continue. Such interests were described by the teacher as "obsessions," and in some cases it was reported that "if he didn't have that obsession he would do much better." The teacher described how the child with autism would prioritise their special interest over peer interactions, resulting in decreased social play when the special interest was no longer a priority for peers. For example, she stated that "eventually [peers] get bored when they play

and kids move to another activity, so he doesn't follow them." Again, the play interaction was dependent on both the child with and without autism continuing to be interested in the same activity. This meant that when peers moved to engage in a different play activity, the child with autism did not follow, thus terminating the play interaction.

The teacher elaborated on the restrictive nature of relying on special interests to attract peers. For example, when describing how some peers are attracted to Vincent's restricted interest of dropping on the floor, the teacher stated that the peers' interest was not maintained for as long, "sometimes kids get bored because he would do the same thing. He drops on the ground and then kids are not interested anymore." However, restrictive interests were not a cause of termination of a play activity for all peers. For example, even if other peers didn't respond to Vincent's atypical attempts to initiate a play interaction, "his friend would respond to that and this is how they play with each other." Whilst a special interest was reported to limit participants' engagement with some peers, the formation of friendships with typically developing peers who were equally prepared to play on one activity for an extended period of time was also reported.

The forming of friendships and subsequent preference for play partners was attributed to shared interests. These interests were associated with activities children liked to participate in. For example, Sam and his friend were reported to "have similar interests. They both like bugs and they love blocks." The teacher described how, on some occasions, participants would engage in activities other than special interests with peers who shared similar interests. For example, when describing Kevin, the teacher said, "He interacts with the same group, with the car group. Like, even if we do not have cars."

An ability to perform a unique task or action was identified as an advantage in attracting peers to participate in a play activity. Peers were described as being attracted to children with autism who displayed skills in an area of shared interest. For example, Sam

attracted peers with both his ability to construct impressive structures from art and craft materials, as well as his ability to lead his peers in a creative and unique dramatic play activity:

> It is amazing and I can tell you that kids stay engaged for half an hour, with everyone singing and Sam was telling them. It's really amazing. I think he is one of the best players in the room, so he really has ideas. That's why he attracts kids, he has ideas.

This contrasts with Vincent's method of attracting peers, which involved using his special interest of physical humour, such as falling over and laughing. Whilst both methods attracted peers to engage in social play with the child with autism, the teacher noted that the more mature activities maintained play interactions successfully. Specifically, the ability to contribute ideas in play was reported to attract peers to the child with autism. The teacher hypothesised that this allows the child with autism to ensure that the play activity continues in their preferred direction.

Physical activity. The use of physical movement during play was a key theme across all interviews. Physical movement to initiate and continue play with peers was discussed across all four participants. Two sub-themes were identified as (1) physical activity in social play, and (2) accessibility of physical activities.

The teacher described her perception of how participants used physical movement during social play with peers. Both positive and negative perceptions were described. Participants were described as participating in a range of physical activities with peers. Interestingly, all children were described as exhibiting a level of enjoyment from this type of play. For example, when talking about Rebecca, the teacher reported "Outside she sometimes runs with kids and copies their actions and then she appears to be happy just being with them."

The use of physical movements to initiate and continue play with typically developing peers was perceived to pose challenges when used as the sole strategy for engaging in play with peers. Additionally, the type of physical movements used to engage in play with peers was not always perceived as appropriate by the teacher, though they were successful strategies for the child with autism with some peers. Vincent was described as using physical movements, such as falling on the floor to successfully, though briefly, attract the attention of his peers and initiate a play interaction. The teacher described how Vincent would "do some silly things to get attention from peers so he would jump or lie down on the floor or throw himself on the floor to get attention." This contrasts with the way Rebecca relied on the physical action of holding peers' hands, who would then lead her around the room. Both strategies were successful in initiating and continuing a social interaction during play, but also posed challenges for the child with autism. In Vincent's case, his strategy became repetitive and peers would tire of the game, leaving him to play elsewhere. In Rebecca's case, she became reliant on being led around by her peers and was unable to move to another, possibly more preferred, activity with other peers unless she was led.

Outdoor, physical play was described as providing a setting that was more accessible than indoor play. The teacher described how she believed participants participated in a larger range of roles during play in outdoor, physical movements than indoors. While the complexity of play engaged in was not as advanced as that observed during indoor games with toys, all children were described as participating in more equal roles during physical, gross motor activities.

Outdoor physical movements, such as running, jumping, and climbing were reported as play activities that were likely to promote peer interactions during free-play. The children with autism were described as often copying or following peers during these types of play activities. For example, the teacher described the benefits of Vincent playing outside instead

of inside, "Otherwise, outside he would eventually join. Like when kids jump it's easier because he doesn't need to talk or like he would follow kids in the sandpit and do the same actions so he would make cakes or whatever." This was even the case for Sam, who was described as a "leader" during other play activities. During outdoor activities, the availability of equipment was reported to be a determining factor of the role in which the participant engaged in social play with peers. The teacher stated, "It's up to what is available outside… Sometimes he leads, sometimes he follows."

Role of peers. The role of peers in determining the success of a play interaction between a child with autism and their peers was a common theme throughout all interviews. This theme highlights the complex nature of social play. Three sub-themes were identified that describe different aspects of the role of peers in play. These include (1) preference to lead or follow, (2) peer teaching, and (3) initiating interactions.

Participants with autism were described as leaders or followers. This refers to a child's preference to either direct a play interaction, or follow another child's lead. The teacher discussed her perception of how children select a play partner who will fulfil a role that was needed to participate in play. She explained, "There are kids who are leaders and kids who are followers, so this is what attracts kids." Children who were passive and were described as "followers," such as Rebecca, were described as attracting children who liked to lead during play. Other children, who may not have been as creative in generating play ideas, preferred to follow a leader and therefore were attracted to Sam, who preferred to carry out his own ideas. This describes two children with opposite play styles, both of whom engage in social play with peers. The preference of peers is therefore a variable in determining a play partner and subsequence success of a social play interaction.

Peer teaching was discussed by the teacher describing the way peers facilitated the acquisition of play skills in a child with autism, thus affecting the success of social play

interactions. When discussing Vincent, the teacher stated, "so if they're in the sandpit he will go to them and he will copy what they do. And inside if he plays with blocks they will join and play something with him." However, challenges in using peers to teach play behaviours to children with autism were also identified. When discussing Rebecca, the teacher said:

> The problem is with other kids. Perhaps it's noisy, or sometimes they don't care what Rebecca is saying. You know, they play, they have their own agenda. To do that you need to organise the play situation to have a peer who wants to be a role model. And then, do what he is supposed to do or say.

Peer teaching was discussed by the teacher, with interesting attention to the skill of imitation. Imitation as a strategy to engage in play with a peer was outlined. This strategy was reported as being both beneficial and counterproductive. The child with autism was not always able to determine the difference between positive and negative behaviours to imitate.

The role of peers to initiate and maintain a play interaction was a common theme across all participant interviews. Children with autism were described as relying on typically developing peers to either be invited to join a game, or were reliant on peers to be interested in an activity the child with autism had initiated, and join in. The teacher did not describe this as a characteristic solely associated with autism. The way in which peers initiated play interactions differed between participants and was dependent on the participant's play skills, language skills, and interests. For example, the teacher outlined Rebecca's reliance on peers to initiate a social interaction during play:

> She would wait for the other kids and if she sees something interesting like kids playing in the home corner, she would go and observe. But then she wouldn't do anything, she basically waits for somebody to invite her to play, and then she plays nicely. But, if nobody invites her, she wouldn't play, although she is capable. She has play skills.

This reliance was also noted in Sam, who was a more assertive child with autism. Sam was typically described as a "leader," but still relied on others to play his preferred play activities; "if a child doesn't play, Sam will just keep playing on his own and the child will eventually go away." The role of restricted flexibility requires further investigation to determine to what extent children are unable, or unmotivated to adapt to other's play terms.

Conflict management. The impact of conflict on social play interactions was identified as a key theme. Particularly, conflict around (1) sharing, and (2) problem solving were reoccurring sub-themes. Play behaviours in response to conflict were perceived by the teacher to impact on the success of social play with peers.

Poor conflict management skills around sharing space and materials, and negotiating roles during play, was reported as a determining factor in the breakdown of a social play interaction. Requirements of sharing materials and space during social play were perceived by the teacher to be a major barrier to peer interactions. Learning such sharing behaviours was reported to coincide with improved peer interactions:

He shares. That's the good thing about him. He shares his cars because he finds it more fun to push cars with somebody else, you know, if there are two of them or three, they just run around the room with cars. Additionally, poor problem solving in social situations was attributed to decreased play interactions with typically developing peers. Deficient understanding of social rules resulted in children with autism finding it difficult to solve conflict with peers in a way that did not terminate a play interaction, or in a way that allowed the child with autism to engage in a preferred play activity with a peer.

Although poor conflict resolution skills were a common challenge for all participants, the participants, and their peers, responded differently to this challenge. Rebecca was described as responding to conflict by complying with demands of her peers. The teacher hypothesised, "Sometimes she doesn't understand situations properly, if she was told to move

away, she would move away even if she was happy, because she thinks she needs to move away. So, it's really hard." Vincent and Kevin were reportedly more likely to respond to conflict by arguing or crying. Sam reportedly responded by first attempting to avoid conflict by being the leader in an activity, and if that failed then by moving to participate in something else. A belief in the need to be flexible in play was conveyed, "He has to learn that if you want to play with somebody you sometimes need to follow somebody else's ideas." These different approaches all lead to the termination of a social interaction during play, rather than repairing an interaction so that social play continued.

Verbal behaviours. The use of verbal communication during play was discussed across all participants. The teacher described her perception of the importance of functional, social communication skills on social interactions with peers during play. Sub-themes of (1) verbal success, and (2) verbal value were identified through thematic analysis of interview transcripts.

Verbal communication skill was described by the teacher as a determiner for successful play interactions with peers. Poor use of verbal communication in a social context was perceived as having a negative impact on social interactions with peers. This was described as an obstacle to both initiation and continuation of social play with peers. Rebecca was described as showing difficulty initiating social interactions during play due to compromised social-communication skills, "If she is about to join in she wouldn't say, 'oh, what are you doing?'. She wouldn't make comments, or 'are you doing something?'. She just waits."

The use of verbal comments and questions was valued by the teacher as an important skill to maintain social interactions during play. The teacher indicated that the child with autism's ability to apply their language skills in a functional, social manner was associated with successful peer interactions during a play activity. Conversely, poor initiation of play

with peers, limited peer interactions during play, and a breakdown in play interactions following conflict, was attributed to difficulty in applying verbal communication to a play situation. The teacher stated, "I think language. He needs that really badly. And I think he's frustrated because he can't talk and because of his behaviour."

Enjoyment. The interaction between enjoyment of social play and children's own interests was identified as a key theme that overlapped with all other identified key themes. A desire to interact was discussed as a motivating factor in the use of play behaviours across all participants. The teacher reported a belief that the child with autism showed a desire to play with peers, but lacked the appropriate skills to do so. For example, when referring to Vincent, the teacher stated:

> He desperately wants to interact, but does not have skills to do that because he did not initiate any functional play and he didn't have any verbal skills to start an interaction so he wouldn't make a comment or say something to a kid."

> Similarly, when referring to Kevin, the teacher stated, "Kevin's a very social kid, but he still doesn't have good play skills. He could do better, but he loves kids, he loves being with other kids."

A desire to interact was reported as a motivator in the acquisition of new play skills. For example, it was believed that Sam learnt to share play materials to maintain play interactions with peers: "And he realised 'if I want to play I need to share the space and materials.' So, he started to share." This desire also appeared to contribute to less desired play behaviours. For example, Rebecca carrying out instructions from peers that she may not want to do. However, the teacher discussed her perception of how a desire to interact socially with peers was not always enough of a factor to guarantee social play. The teacher perceived that special interests were described as sometimes being valued more highly by the child with autism than social interactions. When discussing Vincent, she stated:

So he plays with them, and he loves playing with kids, but if he's building his garage or whatever and the kid puts a block on top of his structure he will remove that block a little bit because he has it in his mind, but he still plays, he wouldn't move away. Or, he lets other kids join in and lets them play with the same toys, so that's it.

Although this theme does not directly address the research topic of play behaviours in children with autism, it does indicate that developing play interactions between children with autism and their typically developing peers may be a relevant goal to both educators and children with autism.

Overlap of key themes. An overview of key themes and their overlap are presented in Figure 3 and are discussed below. Of marked connection are the relationship between the themes special interests and skills, and verbal behaviours with other identified themes. Special interests and skills are discussed by the teacher both in relation to the role of peers and enjoyment. The teacher described her perception of how peers are attracted to interact with the child participant if they share common interests and find enjoyment in similar play activities. For example, when describing how Kevin attracts peers to play with him, she stated, "it's based on interest. But he might offer a car to another kid and this is how it starts."

Additionally, the relationship between the theme verbal behaviours and physical activity and conflict resolution was discussed. The teacher discussed her perception of how physical behaviours are used to compensate for deficits in verbal communication. For example, the teacher described her perception of how Vincent used physical behaviours instead of verbal communication, "He would copy actions to join in so that's it, but what I'm saying is if he had language it would help him, if he at least used that language it would help him." Additionally, the role of verbal behaviours in minimising conflict was stated. For example, the teacher explained how Rebecca's limited use of verbal language in social

settings negatively impacted on her ability to resolve conflict, "Rebecca cannot tell them, 'I

don't want to do that, I want to play with someone else'.

Physical activity

Verbal behaviours

Teacher's perception of play behaviours of participants during play with typically developing peers

Special interests and skills
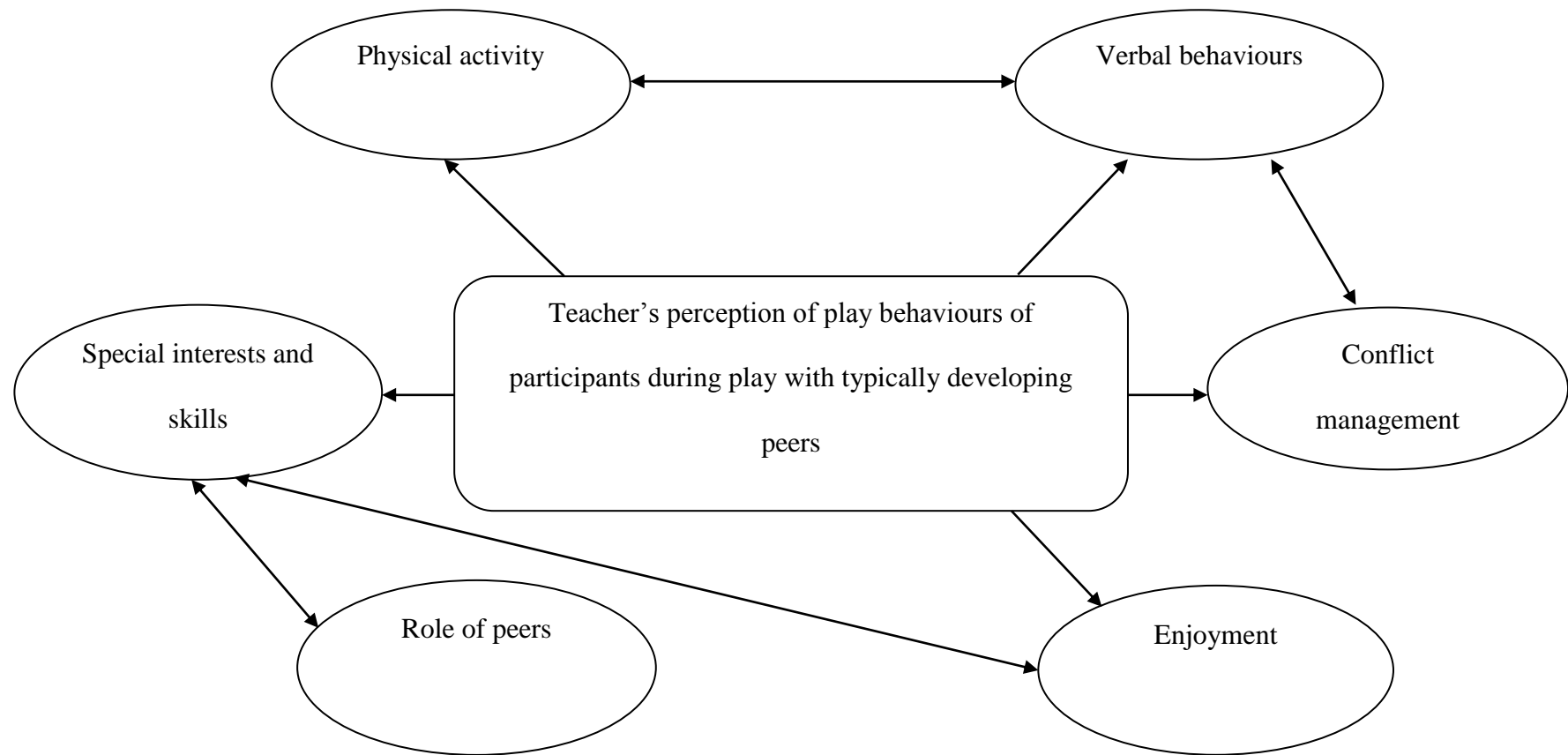
Conflict management

Role of peers

Enjoyment

Figure 3. Analysis of Interview Transcripts

Thematic Analysis of Observational Data

Participants were observed during both indoor and outdoor free-play with typically developing peers. Parallel, associative, and cooperative play was observed during a range of play activities. Play activities participants engaged in are outlined in Table 5.

Table 5

Play Activities Observed

Participant	Play activities observed
Kevin	Ball, blocks, chasing, cubby house, dancing, gathering toys, glasses, hoops, reeds in garden, running, sandpit, slapping hand/pretending ice cream, slide, stepping stones, toy tools, toy washing machine, wheelie toy
Rebecca	Beam, boggle, following peers, magnets, Mr Potato Head, pretend stamping, pretend swimming, pretend teacher, puzzle, singing, yoga
Sam	Box construction, dolls house, drawing, Duplo, painting, puppet construction, racing, sandpit, singing, toy tools
Vincent	Blocks, cars, construction boxes, home corner, drawing, jumping, painting, Play Doh, toy tools

Thematic analysis of behaviours recorded during observation of free-play with typically developing peers revealed six key themes. Themes included (1) proximity, (2) verbal behaviours, (3) nonverbal behaviours (4) object transfer, (5) complexity of play, and

(6) adult interactions. Behaviours were coded within each identified theme. A summary of key themes and subthemes identified are presented in Table 6. A description of coded behaviours, and observations of the participants' social play with peers following each behaviour, is outlined below.

Table 6

Key Themes from Thematic Analysis of Play Behaviours Observed in Children with Autism with Typically Developing Peers During Free-Play

Theme	Code	Subtheme	Description
Proximity	P1	Towards peer	Participant moves towards a peer to join an interaction (e.g. approaches group of peers at an activity table) or follows a peer (e.g. follows peer during a chasing game).
	P2	Away from peer	Participant moves away from peers to participate in another activity, either with or without the intention of peers following.
Verbal behaviour	V1	Verbal behaviours about self	Participant produces a verbal comment or question about himself or his belongings. Comments and questions include those addressing attributes (e.g. "big"), opinion (e.g. "great"), or description (e.g. "I'm making a sword"). Comments and questions about ownership or having a turn are coded separately as 'V3.'
	V2	Verbal behaviours about others	Participant produces a verbal comment or question about another person or objects belonging to someone else. Comments and questions include those addressing attributes (e.g. "big"), opinion (e.g. "great"), or description (e.g. "That's a Potato Man").

Theme	Code	Subtheme	Description
			Comments and questions about ownership or having a turn are coded separately as 'V3.'
	V3	Verbal behaviour about ownership or having a turn	Participant produces a comment or question about the ownership of an object, or whose turn it is to have an object or perform an action. Comments and questions can be statements with or without dispute.
	V4	Symbolic noises and singing	Participant verbalises sounds that are either symbolic in nature (e.g. "brrrmmm" to symbolise a car noise) or singing.
	V5	Formal verbal greeting	Participant produces a formal verbal greeting, such as "hi," or "hello."
Nonverbal behaviours	NV1	Draws attention to self, a peer, or an object using a nonverbal behaviour	Participant uses a nonverbal behaviour to gain or give attention to himself, a peer, or an object (e.g. looking towards a peer or common object, holding up an object to show a peer, or a gesture such as pointing).
	NV2	Negative nonverbal behaviour	Participant expresses negative emotions or opinions without words (e.g. cries, screams, pushing, hitting). Behaviours are classified as 'negative' if they convey a sad or angry emotion, or involve physical contact that causes harm to another person or property.
	NV3	Positive nonverbal behaviour	Participant expresses positive emotions or opinions without words (e.g. smiles). Behaviours are classified as 'positive' if they convey a happy or excited emotion, or involve physical movement that has a positive affect (e.g. hugging or assisting a peer).

Theme	Code	Subtheme	Description
Object transfer	OB1	Relinquishes object	Participant relinquishes an object by giving it to a peer or putting the object down in the play area.
	OB2	Gains an object	Participant gains an object by taking it with or without permission from a peer or the play area.
Complexity of play	PL1	Physical engagement	Participant produces a physical movement as part of a play activity (e.g. imitating physical activities, moving aside to let a peer pass, sitting when instructed by peer to do so, or walking on a beam).
	PL2	Non-functional play with objects	Participant uses objects in play in a way which is different to how it is intended to be used (e.g. spinning blocks, or holding objects as a way of engaging in a play activity).
	PL3	Functional play	Participant uses objects in play in a way in which they were intended (e.g. stacking blocks, or drinking from a toy cup).
	PL4	Dramatic play act	Participant engages in a play behaviour that reflects his/her role in a pretend play situation (e.g. raising a hand to ask a question when playing the role of student while a peer plays the role of teacher).
Adult interaction	A1	Adult interaction	The participant's behaviour involves an interaction with an adult.

Proximity. Behaviours involving the participant moving either towards or away from peers were recorded. Sam moved both towards and away from peers to participate in different play activities. Peers were observed following and selecting their play activity based on what

Sam was engaged in. This contrasts with the other three participants, who were all observed moving towards peers more often than away. Moving towards peers was often observed to be followed by play interactions with peers continuing, whilst moving away from peers was more often observed to result in a play interaction being terminated. Parallel, associative, and cooperative play were all observed while participants both moved towards and away from peers. A summary can be seen in Table 7.

Table 7

Proximity and Continuation of Play Between Children With and Without Autism

Play behaviour of Participant	Description of behaviour	Consequence
Moves towards peer	Participant moves towards a peer to join an interaction.	Peers observed engaging in the same play activity with the participant.
Moves away from peer	Participant moves away from peers to participate in another activity, either with or without the intention of peers following.	Peers observed engaging in a different play activity to the participant in three out of the four participants.

Verbal behaviours. Verbal behaviours were coded as (1) verbal behaviours about self, (2) verbal behaviours about others, (3) verbal behaviours about ownership or having a turn, (3) symbolic noises and singing, and (4) formal verbal greetings. A summary of verbal behaviours used with participants and social play interactions with typically developing peers that followed are outlined in Table 8.

Sam's verbal behaviours were predominately focused on others. These included comments, instructions, and questions about what others were doing or holding. Both

continuation and termination of play activities with peers was observed following Sam's verbal behaviours about others. This contrasts with consequences to Sam's verbal comments about himself, which were still prevalent, but observed less often. Comments about himself were most often responded to by peers with a play activity continuing between Sam and his peers. Interestingly, verbal comments and questions about ownership did not negatively affect the continuation of a play activity between Sam and his peers. Symbolic noises and singing were not as commonly observed behaviours. Similarly, formal greetings were not commonly observed. Sam was observed engaging in associative and cooperative play more often than parallel play when verbal behaviours were recorded.

Rebecca's verbal behaviours were predominantly comments or questions about another person or object in another person's possession. Verbal behaviours about others were followed by a continuation of social play with peers on most occasions. Rebecca was observed directing some verbal comments and questions about herself to her peers, which were followed by continued play with peers. Only one example of Rebecca using comments and questions to talk about ownership was recorded. This example was followed by her continuing to engage in social play with peers. Similarly, the use of singing and symbolic noises was rarely observed, and when used was followed by continued play with peers. Formal greetings were not observed. Like Sam, Rebecca was observed engaging in associative and cooperative play more often than parallel play when verbal behaviours were recorded.

Kevin was observed using verbal comments and questions about himself, others, and ownership. Within the parameters of qualitative data analysis, there was no noticeable difference between the occurrence of different types of comments and questions. To a lesser extent, he was observed using formal greetings, and singing or symbolic noises during play with peers. All verbal behaviours were often, though not always, observed to be followed by

the continuation of play with peers. As with Sam and Rebecca, Kevin was observed engaging in cooperative play when verbal behaviours were recorded. However, no major observable difference was observed between the frequency of parallel and associative play.

Vincent's verbal behaviours were observed as comments or questions about himself and others, including objects in possession. Comments and questions about self and others were often observed to be followed by continuing to play with a peer, though occasionally was followed by a play interaction terminating. Formal greetings were not observed. Fewer verbal behaviours were recorded when describing Vincent's play than other participants. Social participation was predominately defined as parallel play when recording verbal play behaviours.

Table 8

Verbal Behaviours and Continuation of Play Between Children with and Without Autism

Play behaviour of Participant	Description of behaviour	Consequence
Verbal behaviours about self	Participant moves towards a peer to join an interaction.	Peers observed engaging in the same play activity with the participant.
Verbal behaviours about others	Participant moves away from peers to participate in another activity, either with or without the intention of peers following.	Peers observed engaging in the same play activity in most instances with the participant.
Symbolic noises and singing	Participant verbalizes sounds that are either symbolic in nature or singing.	Peers observed engaging in the same play activity in most instances with the participant.
Formal verbal greeting	Participant produces a formal verbal greeting, such as "hi," or "hello."	Peers observed engaging in the same play activity with the participant.

Nonverbal behaviours. Nonverbal behaviours were coded as (1) draws attention to self, a peer, or an object using a nonverbal behaviour, (2) negative nonverbal behaviour, and (3) positive nonverbal behaviour. A summary of nonverbal behaviours and social play interactions that followed with typically developing peers is outlined in Table 9. All four participants drew attention to themselves, a peer or an object using nonverbal behaviours. Following such joint attention, social play with peers was continued. Sam did not frequently

use nonverbal behaviours to express emotions or opinions, either positive or negative. Rebecca and Vincent were observed using positive nonverbal behaviours to express emotions and opinions, such as smiling and holding peer's hands. This appeared to be a successful behaviour to continue play with peers. Kevin used both positive and negative nonverbal behaviours to express emotions and opinions. Interestingly, behaviours that may be defined as negative by an adult did not necessarily follow in the termination of a play activity with peers. Parallel, associative, and cooperative play were all observed to take place during nonverbal play behaviours.

Table 9

Nonverbal Behaviour and Continuation of Play between Children With and Without Autism

Play behaviour of Participant	Description of behaviour	Consequence
Draws attention to self, a peer, or an object using a nonverbal behaviour	Participant uses a nonverbal behaviour to gain or give attention to himself, a peer, or an object.	Peers observed engaging in the same play activity with the participant in most instances.
Negative nonverbal behaviour	Participant expresses negative emotions or opinions without words.	Peers observed engaging in the same play activity with the participant in most instances.
Positive nonverbal behaviour	Participant expresses positive emotions or opinions without words.	Peers observed engaging in the same play activity with the participant.

Object transfer. Object transfer was recorded as a participant either relinquishing or gaining an object. All participants both gained and relinquished objects from peers during

play. Peers continued to engage in social play when objects were transferred, even if they were transferred without permission from the peer. Interestingly, all recorded instances of gaining an item were followed by a play activity being continued with peers, whereas relinquishing an item was observed to be followed by a play activity being terminated on some occasions. A summary is presented in Table 10. Again, parallel, associative, and cooperative play were all observed to take place during both relinquishing and gaining objects.

Table 10

Object Transfer and Continuation of Play Between Children With and Without Autism

Behaviour	Description of behaviour	Consequence
Relinquishes object	Participant relinquishes an object by giving it to a peer or putting the object down in the play area.	Peers were mostly observed continuing a play activity with the participant.
Gains an object	Participant gains an object by taking it with or without permission from a peer or the play area.	Peers were observed continuing a play activity with the participant.

Complexity of play. Complexity of play identified the type of play engaged in. Play was coded as (1) physical engagement, (2) non-functional play with objects, (3) functional play, and (4) dramatic play act. A summary of these play behaviours and subsequent social play with typically developing peers is outlined in Table 11.

Sam's play was predominately functional, meaning that he engaged with play materials in the way in which they were intended. Functional play was a successful way to maintain social interactions with peers, though did not guarantee that play interactions would not be terminated. In additional to functional play, Sam demonstrated non-functional use of objects during play. Peers responded to Sam's non-functional play by continuing to engage in social play with him. Dramatic play behaviours with peers were not observed as often, but when observed were successful in continuing social play with peers. Physical movements were less frequent than other play behaviours, but resulted in peer's continuing to engage in the same play activity with Sam.

Rebecca engaged in physical play, functional play, and to a less extent dramatic play. Some non-functional play was also observed. Functional play behaviours were often followed by play with peers terminating, whilst other types of play were often followed by social play with peers continuing.

Kevin was observed frequently using physical engagement to interact with peers during play. Though to a lesser extent, non-functional play behaviours and dramatic play were also frequently observed. All types of play were frequently followed by the continuation of a play interaction.

Vincent engaged in both functional and non-functional play with peers. He was not often observed using physical engagement or dramatic play during play. Functional play behaviours were often observed to be followed by social play with peers being terminated.

Parallel, associative, and cooperative play were observed across all levels of play complexity. All participants engaged in cooperative play during functional, non-functional, and cooperative play. Interestingly, only Kevin was observed engaging in cooperative play when using physical engagement.

Table 11

Complexity of Play and Continuation of Play Between Children With and Without Autism

Behaviour	Description of behaviour	Consequence
Physical engagement	Participant produces a physical movement as part of a play activity.	Peers were mostly observed continuing a play activity with the participant, though some termination of social play interactions or refocusing on a different activity was also observed.
Non-functional play with objects	Participant uses objects in play in a way which is different from the way they are intended to be used.	Peers were mostly observed continuing a play activity with the participant, though some termination of social play interactions or refocusing on a different activity was also observed.
Functional play	Participant uses objects in play in a way they were intended to be used.	Peers were mostly observed continuing a play activity with the participant, though some termination of social play interactions or refocusing on a different activity was also observed.

Behaviour	Description of behaviour	Consequence
Dramatic play act	Participant engages in a play behaviour that reflects his/her role in a pretend play situation.	Peers were mostly observed continuing a play activity with the participant, though some termination of social play interactions or refocusing on a different activity was also observed.

Adult interaction. Adult interaction during free-play with typically developing peers was observed in varying degrees among participants. Sam and Kevin sought out adult interactions during free-play time with peers. For both participants, adult interactions did not always terminate play with peers, but in some cases resulted in the play activity with peers being redirected to a different game or terminated. Rebecca and Vincent were not observed frequently seeking adult interactions during free play with peers. A summary of observations of adult interaction during free-play with typically developing peers is outlined in Table 12. Parallel and associative play with peers was observed when participants engaged with adults. Interestingly, cooperative play was not observed when adult interactions were recorded.

Table 12

Adult Interaction and Continuation of Play Between Children With and Without Autism

Behaviour	Description of behaviour	Consequence
Adult interaction	The participant's behaviour involves an interaction with an adult.	Peers were mostly observed continuing a play activity with the participant, though some refocusing and termination of social play interactions were also recorded.

Quantitative Analysis of Observational Data

The frequency of parallel, associative, and cooperative play acts was calculated for each Antecedent-Behaviour-Consequence sequence. Definitions of social participation used during data collection are outlined in Appendix H. Results can be seen in Table 13. Overall, all levels of social participation were recorded. However, for each individual child, the total number and proportion of types of social participation appears to differ. This is consistent with observations from descriptive data, which identified differences across participants.

Table 13

Frequency of Parallel, Associative, and Cooperative Play Acts (Percentage of Child's Acts)

	Kevin	Rebecca	Sam	Vincent	Total
Parallel Play	82 (36%)	68 (39%)	56 (25%)	55 (59%)	261 (36%)
Associative Play	39 (17%)	57 (32.5%)	89 (40%)	27 (29%)	212 (30%)
Cooperative Play	107 (47%)	50 (28.5%)	78 (35%)	11 (12%)	246 (34%)

Discussion

In this research project, play behaviours used by preschool-aged children with autism in parallel, associative, and cooperative play are examined. Behaviours that precede the continuation, refocusing, and termination of play with typically developing peers were described and the social participation in which play takes place was identified. Information given by each participants' teacher provided contextual information for observed behaviours. Given that children with autism demonstrate less developed play skills than typically developing children (Hobson et al., 2013), and that play interactions are important for the development of social competence (Jenvey & Newton, 2011), examination of play behaviours in children with autism is an important area of study. This strengths-based study contrasts with previous research into play and children with autism, which predominantly focuses on differences between frequency and quality of behaviours in comparison to peers by outlining deficits in social participations during play (Jahr et al., 2007) and play behaviours (Barton, 2010).

To answer the primary research question, 'What behaviours do young children with autism display during play with their typically developing peers in an early childhood setting?' play behaviours young children with autism display during free-play with typically developing peers in an inclusive early childcare setting are described. To answer the secondary research question, 'What is the participants' teacher's perception of behaviours young children with autism display during play with their typically developing peers in an early childhood setting?' participants' teacher's perception of play behaviours of young children with autism are examined. Behaviours observed in young children with autism during play with typically developing peers in Phase 2 of the research project are discussed below. The teacher's perceptions of play behaviours emerging from Phase 1 are discussed

within the context of key themes that emerged from Phase 2. Clinical implications are then suggested.

Play Behaviours in Young Children with Autism

      Proximity. Continuation of play following a participant moving away from peers was not consistent across all participants. For three out of four participants, moving away from peers was observed to be followed by a termination of a social play. For the remaining participant, peers were observed following him to continue participating in a play activity together. Whilst termination of social play appears to be a predictable consequence of moving away from peers, the discrepancy in one participant who was followed by peers suggests that other factors play a role in determining the impact of proximity on social participation during play.

      Teacher's perception. The teacher's perception of participants' relationships with typically developing peers provides possible contextual information that addresses this discrepancy. The child who was followed by peers was described by his teacher as a leader, and someone who attracts peers because of his creative play skills. Whilst this explanation relies on the perception of one teacher, and conclusions cannot be drawn from a single case study, this example does raise the issue of how an individual's role within a group impacts on play interactions.

      In this case, data addressing the primary and secondary research questions can be collaborated to provide a richer understanding of play behaviours of young children with autism. Observational data indicates that moving away from peers is more likely to terminate a social play interaction. However, the teacher's perception suggests the possibility of social dynamics over-riding moving away being followed by a termination of social play with typically developing peers.

In addition to social dynamics, the role of special interests and skills in play with typically developing peers was both discussed by the teacher and observed during free-play sessions, and may provide context for the effect of proximity on play. The four participants exhibited different interests and skills, yet all engaged in social play with peers. For the most part, participants were observed engaging in activities consistent with those reported by the teacher as preferred activities. The teacher outlined her perception of activity choice by stating that interests and skills play a role in determining which play activity the child with autism engages in, and by extension who they play with. The teacher hypothesised that three out of four of the children with autism attracted children who had similar interests. The idea that shared interests between children with and without autism may be possible is supported by Thiemann-Bourque et al. (2012), who found no significant difference in expressed interest in playing with different toys or diversity of object play in children with and without autism. However, the narrower and deeper nature of the participants' interests led to the children with autism choosing preferred play activities over social interactions. This is consistent with the teacher's report that as peers choose to engage in other activities, the child with autism does not always follow, thus terminating social play interactions.

Clinical implications. It is proposed that the use of special skills and interests to initiate and continue play should be considered when designing an intervention program aimed at improving social play. This individualised approach would have an impact on the design and provision of group-based intervention. Additionally, the environmental set-up of the classroom, and how it allows access to shared interests, should be considered as part of intervention planning to promote successful play interactions with peers.

In response to the role of special interests and skills in play, it is suggested that teaching children with autism to transition to new activities with peers may prolong social

participation. However, consideration of the child's role in group dynamics should be accounted for when deciding the relevance of teaching this behaviour.

Verbal behaviours. The role of verbal play behaviours was a key theme in both phases of data collection. Verbal communication was used by all participants to successfully engage in play with typically developing peers. Although the focus of verbal behaviours differed between participants, both verbalisations focusing on self and others were followed by continued play interactions. The use of formal greetings was rarely observed.

Teacher's perception. Observations of verbal behaviours during play were consistent with reports from the teacher, who described her perception of the importance of verbal communication. She was recorded as commenting on the positive correlation between expressive language skills and successful play interactions with peers. Adult interaction during free-play with typically developing peers was observed in varying degrees among participants. Although the exact relationship between language and play in children with autism remains uncertain (Manning & Wainwright, 2010), researchers have stressed the importance of verbalisations during play (Barton & Wolery, 2008; Barton, 2010).

Clinical implications. Given the role of verbal behaviours in continuing social play, and the importance of language skills outlined in the literature, addressing the use of verbal behaviours in play is therefore recommended. Use of language skills to express information about self or others should be a focus of intervention targeting play in children with autism. In order to have a positive effect on peer interactions, intervention should target language skills and register that are consistent with those used by typically developing peers. For example, the limited use of formal greeting indicates that formal greetings should not be a behaviour targeted to increase social interactions between children with autism and typically developing peers.

Nonverbal behaviours. Continuation of social play was followed by both positive and negative nonverbal behaviours. This provides an interesting perspective on the difference between child and adult perception of ideal behaviours.

Teacher's perception. Whilst the coding of positive and negative behaviours was subjective in nature, coding of observations appears to be consistent with the perceptions of the participants' teacher. The teacher reported that the participants used behaviours that she considered inappropriate to successfully engage peers in play, such as falling on the floor. However, the teacher reported long term disadvantages to such tactics as peers tired of unconventional strategies.

In addition to the use of perceived-negative play behaviours to successfully engage in social play with peers, the teacher discussed her concern that participants did not always imitate positive models. This is particularly interesting as social modulation of imitation is an important developmental ability which is often compromised in children with autism (Cook & Bird, 2012). Investigation into the use of imitation to engage in social play with peers would be a relevant behaviour to describe when replicating this study in the future.

Clinical implications. As children are expected to interact with peers in a way that is meaningful to other children, identifying differences between child and adult perceptions of positive behaviours is important. This is especially imperative because adults develop intervention goals and behavioural targets. It is suggested that nonconventional play behaviours, perhaps viewed unfavourably by adults, can still precede social play with typically developing peers. However, the sustainability of such play behaviours as a successful means of engaging in social play is unclear. Such findings highlight the importance of considering a child's peer group when developing intervention goals.

Object transfer. Transfer of objects between participants and peers, and the subsequent continuation or termination of play was recorded. While the small sample size

limits the generalisability of findings to the autism population, examples of termination of a play activity with peers following relinquishing an object were observed. Whether objects were transferred willingly or unwillingly was not coded during observations of play. Examining whether relinquishing of objects was with or without permission would further assess the importance of sharing during play. Description of object use within the context of sharing differs to the focus of object use in the literature, which focuses on the repetitive nature of object use (Williams et al., 2001; Williams, 2003) and toy preferences (Dominguez et al., 2006).

Teacher's perception. The teacher's perception of the importance of sharing to engage in play with typically developing peers suggests the need to examine object transfer in play further. The teacher perceived poor conflict resolution around sharing materials and space, and poor role negotiation, as contributing to a breakdown in the continuation of a play activity with peers. This observation is supported by current literature, which describes sharing as a skill that is difficult to master by children with autism, however this is identified as an important skill for facilitating positive social interactions with peers (Gilley & Ringdahl, 2014).

Clinical implications. The role of object transfer, shared space, and conflict management in social play should be factored in to play intervention plans. Such behaviours require the involvement of peers, suggesting that intervention should consider the environmental and social context in which play takes place. Excluding this context does not allow for meaningful application of play behaviours as it ignores the need for a child to interact with play objects, and in certain spaces, within a group context.

Complexity of play. Continued social-play with typically developing peers was observed to follow functional, non-functional, and dramatic play. Interestingly, all participants were observed engaging in physical activity with peers, such as chasing,

jumping, and dancing. These physical behaviours took place both inside and outside. Physical movement took place during parallel, associative, and cooperative play. This suggests a possible advantage to using physical play behaviours to engage in social play with typically developing peers. Previous studies indicate that the quality of functional play in preschool-aged children with autism is atypical (Williams et al., 2001), whilst differences in symbolic play are disputed (Naber et al., 2008; Wong & Kasari, 2012). A review of the literature indicates that children with autism with more complex play skills are more socially interactive (McAloney & Stagnitti, 2009) and less socially disruptive (Uren & Stagnitti, 2009). Results from this study do not refute these findings, but rather present a picture of a range of types of play being used to successfully engage in social play.

Teacher's perception. The use of physical movement during play was also perceived by the participants' teacher to be a successful strategy used by participants to engage with peers in play. However, the teacher placed value on children's ability to use verbal behaviours, and functional play skills.

Clinical implications. In this research project questions are raised about whether earlier developing play skills are sufficient for maintaining social play with typically developing preschool-aged peers. Merits of extending a child's play skills for reasons other than the development of social interactions, such as a child's ability to form symbolic representations of the world, explore sensory and motor skills, and develop social-communication skills (Tsao, 2002), is not argued. However, further research into this area may have consequences for the degree of emphasis placed on developing complex play skills to increase social play between children with autism and typically developing peers.

Adult interaction. The role of adult interaction was recorded when describing play behaviours. These interactions were observed to be followed by continued social play with peers. Whilst social play with and without adult-interactions was not compared in this study,

this observation suggests that adult involvement does not hinder peer interactions. Wider study into this area could contribute to teachers' understanding of how to facilitate play with peers.

Social Participation

In this research project play behaviours used by children with autism during parallel, associative, and cooperative play are described. The role of participants within play interactions was varied. It appeared that participants sought out play-partners that they felt complimented their own play preferences. The teacher reported that all participants had peers with whom they more commonly played. The teacher hypothesised that the participant who liked to lead activities interacted with peers who were interested in following. Conversely, the participants who were described as more passive were reported to interact with peers who preferred to lead interactions. This observation is inconsistent with Stirling and Douglas (2012), who noted that children with autism showed a preference for directing interactions.

Descriptions of social participation during play provide an important, understanding of the context in which play behaviours occurred. Most interesting was the recording of associative and cooperative play, such as physical movement and functional use of objects. This suggests that intervention should include the development of play skills as linked to development generally, as well as the development of play skills at all levels as social play. Meaning, that later developing play skills should not be promoted at the exclusion of earlier developing play behaviours.

Based on the above finding, the use of strength-based goals that consider the child's environment and role within a peer group when targeting the development of play in preschool-aged children with autism is recommended. For the child participants, developing goals that consider the child's strengths within their natural play context is suggested by observations made of participants playing with typically developing peers and their teacher's

perception of their play. Examination of a larger sample size would help determine if these

conclusions can be applied to a wider population.

Limitations

The small sample size does not allow for the heterogenous nature of autism to be represented and limits application to a wider autism population. Furthermore, the fact that all participants came from the same preschool means that participants may have been taught similar play behaviours, influencing behaviours observed. Similarly, the fact that only one teacher was interviewed, and that this teacher had experience in working with children with autism, means that data cannot be seen to represent all teachers. Larger studies are needed for results to be generalised to a wider population of children with autism.

As data was collected online and many behaviours were not recorded, the possibility of bias in recording and analysing data is high. Additionally, the researcher interpreted the intention of a behaviour. Bias was minimised by independent simultaneous coding by a research assistant, however as no formal hypothesis was formed before data collection and analysis, the researcher's bias in identification of certain behaviours may have influenced what and how observations were interpreted.

In this study, play behaviours used by preschool-aged children with autism from the perspective of an adult without autism are described. Studying the topic from the perspective of children with and without autism, such as interviews with children, would potentially add to our understanding of which behaviours are valued by children involved in play.
As a pilot study employing an inductive approach, key themes of play behavior were identified after descriptive data were collected. Future studies would potentially build on these findings by calculating the frequency of these identified themes. Frequency data would determine which play behaviours that lead to continued social play with peers are more prominent and should be focused on when formulating intervention goals.

Conclusion

Play behaviours of preschool-aged children with autism are just one factor affecting social participation in play with typically developing peers. The context in which behaviours occur, as well as individual characteristics of both children with autism and their peers, combine with play behaviours to determine the success of a play interaction. Six key themes were identified from thematic analysis of behaviours observed in children with autism during play with typically developing peers in an early childhood centre. An additional five themes were identified from data collected through semi-structured interviews with a teacher of the child participants. These themes highlight play behaviours used by children with autism when engaging in play with typically developing peers and outline a teacher's perception of play behaviours of young children with autism.

Application of this research project serves as a pilot study for wider research into play behaviours of preschool-aged children with autism. A larger study would allow for conclusions to be made across the autism population. Further research into the key themes identified would have implications for the development and implementation of strength-based intervention programs targeting play in preschool-aged children with autism in natural contexts with their typically developing peers.

References

6, P., Bellamy, C. (2012). *Principles of methodology: Research design in social Science, first edition*. Los Angeles: SAGE.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders, fourth edition, text revision.* Washington, DC: American Psychiatric Association.

American Psychiatric Association. (2013). *Autism Spectrum Disorder.* Retrieved from http://www.dsm5.org

Anderson, A., Moore, D. W., Godfrey, R., & Fletcher-Flinn, C. M. (2004). Social skills assessment of children with autism in free-play situations. *Autism, 8*, 369-385. doi:10.1177/1362361304045216

Barton, E. E. (2010). Development of a taxonomy of pretend play for children with disabilities. *Infants & Young Children, 23*, 247-261. doi:10.1097/IYC.0b013e3181f22072

Barton, E. E., & Pavilanis, R. (2012). Teaching pretend play to young children with autism. *Young Exceptional Children, 15*, 5-17.

Barton, E. E., & Wolery, M. (2008). Teaching pretend play to children with disabilities: A review of the literature. *Topics in Early Childhood Special Education, 28*, 109-125. doi:10.1177/0271121408318799

Bauminger- Zviely, N., Karin, E., Kimhi, Y., & Agam- Ben- Artzi, G. (2014). Spontaneous peer conversation in preschoolers with high- functioning autism spectrum disorder versus typical development. *Journal of Child Psychology and Psychiatry, 55*, 363-373. doi:10.1111/jcpp.12158

Braun, V., & Clarke, V. (2006). Using thematic analysis is psychology. *Qualitative Research in Psychology, 2,* 77-101. doi: 10.1191/1478088706qp063oa

Carpenter, L.A., Soorya, L., Halpern, D. (2009). Asperger's syndrome and high-functioning

    autism. *Pediatric Annals*, 38, 30-35.

Chandler, S., Charman, T., Baird, G., Simonoff, E., Loucas, T., Meldrun, D., ... Pickles, A.

    (2007). Validation of the social communication questionnaire in a population cohort

    of children with autism spectrum disorders. *Journal of American Academy of Child

    and Adolescent Psychiatry, 46*, 1324-1332. doi:10.1097/chi.0b013e31812f7d8d

Charman, T., & Baron-Cohen, S. (1997). Brief report: Prompted pretend play in

    autism. *Journal of Autism and Developmental Disorders, 27,* 325–32.

    doi:10.1023/A:1025806616149

Cole, M., Dore, J., Hall, W. S., & Dowley, G. (1978). Situational variability in the speech of

    preschool children. *Annals of the New York Academy of Sciences, 318*, 65-105.

    doi:10.1111/j.1749-6632.1978.tb16356.x

Cook, J. L., & Bird, G. (2012). Atypical social modulation of imitation in autism spectrum

    conditions. *Journal of Autism and Developmental Disorders, 42*, 1045-1051.

    doi:10.1007/s10803-011-1341-7

Dominguez, A., Ziviani, J., & Rodger, S. (2006). Play behaviours and play object preferences

    of young children with autistic disorder in a clinical play environment. *Autism, 10*, 53-

    69. doi:10.1177/1362361306062010

Eaves, L. C., Wingert, H. D., Ho, H. H., & Mickelson, E. C. R. (2006). Screening for autism

    spectrum disorders with the social communication questionnaire. *Journal of

    Developmental and Behavioral Pediatrics, 27*, 95-103. doi:10.1097/00004703-

    200604002-00007

Freeman, S., & Kasari, C. (2013). Parent-child interactions in autism: Characteristics of play.

    Autism, 17, 147-161. doi:10.1177/1362361312469269

Gilley, C., & Ringdahl, J. E. (2014). The effects of item preference and token reinforcement

on sharing behavior exhibited by children with autism spectrum disorder. *Research in Autism Spectrum Disorders, 8*, 1425-1433. doi:10.1016/j.rasd.2014.07.010

Gutierrez, A., Hale, M. N., Gossens-Archuleta, K., & Sobrino-Sanchez, V. (2007). Evaluating the social behavior of preschool children with autism in an inclusive playground setting. *International Journal of Special Education, 22*, 26-30.

Harvey-Jordan, S., & Long, S. (2001). The process and the pitfalls of semi-structured interviews. *Community Practitioner, 74*, 219-221.

Hobson, J. A., Hobson, R. P., Malik, S., Bargiota, K., & Caló, S. (2013). The relation between social engagement and pretend play in autism: Social engagement and play in autism. *British Journal of Developmental Psychology, 31*, 114-127. doi:10.1111/j.2044-835X.2012.02083.x

Jahr, E., Eikeseth, S., Eldevik, S., & Aase, H. (2007). Frequency and latency of social interaction in an inclusive kindergarten setting: A comparison between typical children and children with autism. *Autism, 11*, 349-363. doi:10.1177/1362361307078134

Jarrold, C. (2003). A review of research into pretend play in autism. *Autism: The International Journal of Research and Practice,* 7, 379-390.

Jenvey, V., & Newton, E. (2011). Play and theory of mind: Associations with social competence in young children. *Early Child Development and Care, 181*, 761-773. doi:10.1080/03004430.2010.486898

Jordan, R. (2003). Social play and autistic spectrum disorders: A perspective on theory, implications and educational approaches. *Autism, 7*(4), 347-360. doi:10.1177/1362361303007004002

Kasari, C., Chang, Y. C., & Patterson, S. (2013). Pretending to play or playing to pretend: The case of autism. *American Journal of Play, 6*, 124-135.

Kasari, C., Gulsrud, A., Freeman, S., Paparella, T., & Hellemann, G. (2012). Longitudinal

follow up of children with autism receiving targeted interventions on joint attention

and play = RH targeted interventions on joint attention and play. *Journal of the*

American Academy of Child and Adolescent Psychiatry, *51*, 487–495.

doi:10.1016/j.jaac.2012.02.019

Lai, M., Lombardo, M. V., & Baron-Cohen, S. (2014). Autism. *Lancet, 383*, 896-910.

doi:10.1016/S0140-6736(13)61539-1

Lewis, V., & Boucher, J. (1995). Generativity in the play of young people with autism.

Journal of Autism and Developmental Disorders, 25, 105-121.

doi:10.1007/BF02178499

Manning, M. M., & Wainwright, L. D. (2010). The role of high level play as a predictor

social functioning in autism. *Journal of Autism and Developmental Disorders*, *40*,

523-533. doi:10.1007/s10803-009-0899-9

McAloney, K., & Stagnitti, K. (2009). Pretend play and social play: The concurrent validity

of the child-initiated pretend play assessment. *International Journal of Play Therapy,*

18, 99-113. doi:10.1037/a0014559

Murdock, L. C., & Hobbs, J. Q. (2011). Picture me playing: Increasing pretend play dialogue

of children with autism spectrum disorders. *Journal of Autism and Developmental*

Disorders, 41, 870-878. doi:10.1007/s10803-010-1108-6

Naber, F. B. A., Bakermans-Kranenburg, M. J., Jendoon, M. H. V., Swinkels, S. H. N.,

Buitelaar, S. J. K., Dietz, C.,. . . . Engeland, H. V. (2008). Play behavior and

attachment in toddlers with autism. *Journal of Autism and Developmental Disorders,*

38, 857-866. doi:10.1007/s10803-007-0454-5

O'Grady, M. G., & Dusing, S. C. (2015). Reliability and validity of play-based assessments

of motor and cognitive skills for infants and young children: A systematic review. *Physical Therapy, 95*, 25-38. doi:10.2522/ptj.20140111

Orr, E., & Geva, R. (2015). Symbolic play and language development. *Infant Behavior & Development, 38*, 147-161. doi:10.1016/j.infbeh.2015.01.002

Parten, M. B. (1932). Social participation among pre-school children. *The Journal of Abnormal and Social Psychology, 27*, 243-269. doi:10.1037/h0074524

Partington, G. (2001). Qualitative research interviews: Identifying problems in technique. *Issues in Educational Research, 11*(2), 32-44.

Piaget, J. (2013). *Play, dreams and imitation in childhood*. Retrieved from https://ebookcentral-proquest-com.libraryproxy.griffith.edu.au

Rutter, M., Bailey, A., Lord, C., & Berument, S. K. (2003). *The social communication questionnaire,* Los Angeles: Western Psychological Services.

Sparrow, S. S., Cicchetti, D. V., & Balla, D. A. (2005). *Vineland adaptive behavior scales (2nd ed.)*. Circle Pines, MN: American Guidance Service.

Stirling, L., & Douglas, S. (2012). Metacommunication, social pretend play and children with autism. *Australasian Journal of Early Childhood, 37*(4), 34-43.

Tsao, L. (2002). How much do we know about the importance of play in child development? *Childhood Education, 78*, 230-233.

Thiemann-Bourque, K. S., Brady, N. C., & Fleming, K. K. (2012). Symbolic play of preschoolers with severe communication impairments with autism and other developmental delays: More similarities than differences. *Journal of Autism and Developmental Disorders*, *42*, 863–873. doi: 10.1007/s10803-011-1317-7

Uren, N., & Stagnitti, K. (2009). Pretend play, social competence and involvement in

children aged 5-7 years: The concurrent validity of the child-initiated pretend play assessment. *Australian Occupational Therapy Journal, 56*(1), 33-40. doi:10.1111/j.1440-1630.2008.00761.x

Vygotsky, L. S. (2004). Imagination and creativity in childhood. *Journal of Russian and East European Psychology, 42*, 7-97. doi:10.5007/2175-795X.2014v32n3p919

Wetherby, A. M., Watt, N., Morgan, L., & Shumway, S. (2007). Social communication profiles of children with autism spectrum disorders late in the second year of life. *Journal of Autism and Developmental Disorders, 37*, 960-75. doi:10.1007/s10803-006-0237-4

Williams, E. (2003). A comparative review of early forms of object-directed play and parent infant play in typical infants and young children with autism. *Autism, 7*, 361-377. doi:10.1177/1362361303007004003

Williams, E., Reddy, V., & Costall, A. (2001). Taking a closer look at functional play in children with autism. *Journal of Autism and Developmental Disorders, 31*, 67-77. doi:10.1023/A:1005665714197

Wolfberg, P., Bottema-Beutel, K., & DeWitt, M. (2012). Including children with autism in social and imaginary play with typical peers: Integrated play groups model. *American Journal of Play, 5*, 55-80.

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

World Health Organization. (1992). *International statistical classification of diseases and related health problems* (10th revision. ed.). Geneva World Health Organization.

Xu, Y. (2010). Children's social play sequence: Parten's classic theory revisited. *Early Child Development and Care, 180*, 489-498. doi:10.1080/0300443080209043

Appendix A

Summary of Key Literature

Authors/Title	Purpose	Participants	Play partner	Setting	Findings
Barton, E. E. (2010). Development of a taxonomy of pretend play for children with disabilities. *Infants & Young Children, 23*, 247-261. doi:10.1097/IYC.0b013e3181f22072	To review the literature on pretend play, and to review categories and measurements of play.	Reviewed 37 studies on pretend play in children with autism			Found inconsistencies in the measurement of play. Therefore, developed an operationalized definition of pretend play for analysis for future research.
Boyd, B. A., Conroy, M. A., Asmus, J., & McKenney, E. (2001). Direct observation of peer related social interaction: Outcomes for youth children with autism spectrum disorders. *Exceptionality: A Special Education Journal, 19,* 94-108. doi:10.1080/09362835.2011.565724	To descriptively examine the initiations, responses, and consequences of pro-social behaviour.	8 children with autism (3;0-5;10 years)	Typically developing peers	Mainstream preschool	Children with autism displayed lower rates of pro-social behaviour. Pro-social behaviours were often followed by gaining a tangible object or attention from peer.
Freeman, S., & Kasari, C. (2013). Parent-child interactions in autism: Characteristics of play. *Autism, 17*, 147-161. doi:10.1177/1362361312469269	To compare parent-child play interactions of parents with and without a child with autism.	16 children with autism 16 children without autism	Parent	Test environment	Parents of children with autism showed a higher frequency of initiating play schemes and suggesting and commanding play acts than parents of typically developing children. Parents of children with autism were more likely to respond to play acts with a higher level play act, whilst parents of typically developing children matched or expanded their responses to their child. Parent imitation correlated to longer sequences of play.
Gutierrez, A., Hale, M. N., Gossens-Archuleta, K., & Sobrino-Sanchez, V. (2007). Evaluating the social behavior of preschool children with autism in an inclusive playground setting. *International Journal of Special Education, 22*, 26-30.	To assess social behaviours of children with autism an inclusive preschool.	3 children with autism, aged 4, 5, and 5 years old	Typically developing peers	Playground	Children with autism rarely engaged in social interactions with peers. Staff rarely facilitated interactions with peers. Mere exposure to typically developing children does not facilitate social interactions.

Authors/Title	Purpose	Participants	Play partner	Setting	Findings
Jarrold, C. (2003). A review of research into pretend play in autism. *Autism: The International Journal of Research and Practice,* 7, 379–90.	To review the empirical evidence of difficulties in pretend play in autism.	Review			Children with autism have difficulty in engaging in pretend play. Such difficulty is reduced in structured play situations.
Thiemann-Bourque, K. S., Brady, N. C., & Fleming, K. K. (2012). Symbolic Play of Preschoolers with Severe Communication Impairments with Autism and Other Developmental Delays: More Similarities than Differences. *Journal of Autism and Developmental Disorders*, *42*, 863–873. doi:10.1007/s10803-011-1317-7	To compare play between typically developing children, children with developmental delay and children with autism.	35 children with autism (mean age 49.2 months). 38 children with other developmental delays (mean age 49.7 months)	Solitary play. An adult imitated play, but did not engage in natural play with the child.	Clinic	Children with autism engaged in more conventional play than children with developmental delay. Functional play was the most common play observed across all groups. Play correlated to language and cognitive levels, but not specifically to autism when compared to other developmental disorders.
Williams, E., Reddy, V., & Costall, A. (2001). Taking a closer look at functional play in children with autism. *Journal of Autism and Developmental Disorders, 31*, 67-77. doi:10.1023/A:1005665714197	To refine categories of functional play based on the developmental progression of typically developing peers.	15 children with autism (36–62 months) 15 children with Down Syndrome (18-65 months) 15 typically developing children (11–24 months)	Solitary play	Home	No difference in the proportion of total time spent in functional play was identified between the groups. Children with autism showed less elaborate, varied, and integrated functional play than children without autism. Functional play of children with autism consisted almost entirely of simple acts, less time in integrated play, and fewer functional sequences of play. The authors concluded that children with autism experience deficit in play before symbolic play is due to emerge.
Wu, C. C., & Chiang, C. H. (2014). The developmental sequence of social-communicative skills in young children with autism: A longitudinal study. *Autism, 18,* 385-392. doi: 10.1177/1362361313479832	To investigate the differences in development of social-communication skills between children with and without autism.	26 typically developing children 23 children with autism Children were assessed at age 9,12, and 15 months old	Adult	University play room	Groups showed different developmental sequences of social-communication skills.

Appendix B

Introductory Letter to Recruit Participants

To whom it may concern,

Please find enclosed information about a current research project examining play in 4 to 5 year old children with Autism Spectrum Disorder with peers in main stream early childhood centres (Griffith University ethics reference number 2016/263).

It would be greatly appreciated if the enclosed information sheets and consent forms could be distributed to any potential participants.

Please contact Kim Kliman (kim.kliman@griffithuni.edu.au) for further information.

Kind Regards,

Kim Kliman

Senior investigator: Professor Jacqueline Roberts
Contact Phone: (07) 3735 5630,
Contact Email: j.roberts@griffith.edu.au
Senior investigator: Doctor Kate Simpson
Contact Email: k.simpson@griffith.edu.au
Research team: Kim Kliman
Contact Email: kim.kliman@griffithuni.edu.au
School of Education and Professional Studies

Appendix C

Information Sheet for Teachers

Griffith University Research Project
INFORMATION SHEET FOR TEACHERS OF CHILDREN AT PARTICIPATING EARLY CHILDHOOD CENTRES

Griffith University ethics reference number 2016/263

Who is conducting the research

Senior investigator: Professor Jacqueline Roberts
Contact Phone: (07) 3735 5630
Contact Email: j.roberts@griffith.edu.au
Senior investigator: Doctor Kate Simpson
Contact Email: k.simpson@griffith.edu.au
Research team: Kim Kliman
Contact Email: kim.kliman@griffithuni.edu.au
School of, Education and Professional Studies

Why is the research being conducted?

The research project is being conducted to gather information on behaviours used by children with a specific disorder that lead to successful play with typically developing peers. This research will be conducted by a student researcher under the supervision of staff at Griffith University.

What you will be asked to do

A teacher of a child with autism will participate in two interviews, each approximately one hour and not exceeding one and a half hours, at their workplace. Interviews will be conducted around the topic of how the child with autism plays with typically developing peers in the early childhood centre. Audio from the interviews will be recorded. Recordings will be kept for the duration of the research project, then destroyed.

In order to obtain background information about the participating child, the participating teacher will be asked to complete a Vineland Adaptive Behaviour Scale Teacher Rating Form (approximately 20 minutes), the PENN Interactive Peer Play Scale (approximately 20 minutes), and the Social Communication Questionnaire (less than 10 minutes) if recent records of these assessments are not already available to the researcher.

Staff will be asked to coordinate three free-play times lasting approximately 40 minutes over a period of two months with the researchers so that child participants can be observed during play with peers. Additionally, staff will be asked to distribute information sheets on the research project or parents/caregivers of children who attend the early childhood centre.

The basis by which participants will be selected or screened

Child participants must attend a mainstream early childhood centre. A diagnosis of autism must be confirmed through a paediatrician report. Children must be starting school in the subsequent year. Children will have functional use of verbal language at sentence level, meaning that they are able to verbally express their basic needs and wants with a range of communication partners in complete sentences. Additionally, children must demonstrate functional use of objects in play to be included in the study. Participants with co-morbid conditions associated with social and behaviour deficits will be excluded to ensure that data is based on the impact of autism on the individual rather than other social-communication difficulties.

If more potential participants apply to participate in this research project, participants who attend child care centres in close proximity of each other will be selected over other applicants.

Teacher participants must have known the child with autism with a minimum of two months.

The expected benefits of the research

This research can contribute to how goals are set to promote positive play interactions between children with and without autism. As a small-scale pilot study, this project can assist the development of larger studies in the future.

Risks to you

Negligible risk is anticipated from participating in this research project.

Your confidentiality

Identifiable data will not be shared beyond the research team and participating teachers.
Results from initial screening assessments and observations made during play will be disclosed to each child's parent/caregiver and teacher. Any wider reporting of findings will involve de-identified data, including the names of children, teachers, and childcare centres. Parents/caregivers of other children at the childcare centre will be informed that a research project will be taking place at the centre and that observation of their child may occur. The name and diagnosis of the child being specifically observed will not be disclosed to anyone beyond the research team and early childhood centre staff.

Information gathered during this research study will be securely stored electronically in accordance to Griffith University policies. All data will be de-identified after feedback has been given to each child's parent/caregiver and teacher. As required by Griffith University, all audio recordings will be erased after transcription. However, other research data (interview transcripts, questionnaire responses, and analysis) will be retained in a locked cabinet and/or a password protected electronic file at Griffith University for a period of five years before being destroyed).

Your participation is voluntary

Participation in this research project is voluntary. Participants are free to withdraw from the study at any time.

Questions / further information

Potential participants can contact Professor Jacqueline Roberts (j.roberts@griffith.edu.au) or Kim Kliman (kim.kliman@griffithuni.edu.au) via e-mail for additional information about this project. Additional information may then be provided via email or telephone.

The ethical conduct of this research

Griffith University conducts research in accordance with the *National Statement on Ethical Conduct in Human Research*. If potential participants have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on 3735 4375 or **research-ethics@griffith.edu.au**.

Feedback to you

Feedback of findings related to each child participant will be provided to parents/caregivers and teachers of each child. De-identified findings will be presented academically, such as in thesis and journal article form.

Privacy Statement

The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded. For further information consult the University's Privacy Plan at **http://www.griffith.edu.au/about-griffith/plans-publications/griffith-university-privacy-plan** or telephone (07) 3735 4375.

Appendix D

Consent Form for Teachers

Behaviours of Children with autism that Facilitate Social Play with Typically Developing Peers in an Early Childhood Setting
TEACHER CONSENT FORM

Griffith University ethics reference number 2016/263

Research Team   Senior investigator: Professor Jacqueline Roberts
Contact Phone: (07) 3735 5630,
Contact Email: j.roberts@griffith.edu.au
Senior investigator: Doctor Kate Simpson
Contact Email: k.simpson@griffith.edu.au
Research team: Kim Kliman
Contact Email: kim.kliman@griffithuni.edu.au
School of Education and Professional Studies

By signing below, I confirm that I have read and understood the information package and in

particular have noted that:

- I understand that my involvement in this research will include two recorded interviews about my student's social play; facilitation of observations of the child participant's play behaviours during scheduled free play with peers and distributing of information sheets to parents/caregivers of children enrolled in the early childhood centre.

- I have had any questions answered to my satisfaction;

- I understand the risks involved;

- I understand that there will be no direct benefit to me from my participation in this research;

- I understand that my participation in this research is voluntary

- I understand that if I have any additional questions I can contact the research team;

- I understand that I am free to withdraw at any time, without explanation or penalty;

- I understand that I can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on 3735 4375 (or research-ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project; and

- I agree to participate in the project.

Name of early childhood centre			
Name of teacher		**Name of early childhood manager**	
Signature		**Signature**	
Date		**Date**	

Appendix E

Information Sheet for Caregivers of Child Participants

Behaviours of Children with autism that Facilitate Social Play with Typically Developing Peers in an Early Childhood Setting INFORMATION SHEET FOR PARENTS OF CHILDREN WITH AUTISM SPECTRUM DISORDER

Griffith University ethics reference number 2016/263

Who is conducting the research

Senior investigator: Professor Jacqueline Roberts
Contact Phone: (07) 3735 5630
Contact Email: j.roberts@griffith.edu.au
Senior investigator: Doctor Kate Simpson
Contact Email: k.simpson@griffith.edu.au
Research team: Kim Kliman
Contact Email: kim.kliman@griffithuni.edu.au
School of Education and Professional Studies

Why is the research being conducted?

The research project is being conducted to gather information on behaviours used by children with Autism Spectrum Disorder (autism) that lead to successful play with typically developing peers. This research will be conducted by a student researcher under the supervision of staff at Griffith University.

What you will be asked to do

Information about child participants will be collected. This will involve gathering background information, such as date of birth and languages spoken, and completion of observational check-lists and assessments from each child's parent/caregiver and teacher. Background information will be collected via a telephone interview and will take approximately 10 minutes. Parents will be required to provide a written diagnostic report confirming a diagnosis of autism. Children will be observed during play at their childcare centre with other children for approximately on three occasions 40 minutes over a period of two months. Descriptions of each child's play and responses from their peers will be recorded. There will be no audio or visual recordings of children.

In addition to observation of children during play, the researcher will conduct two interviews with each child's teacher; one at the beginning and one at the end of the research project. Teachers will be asked to provide information on how the child participant plays with their peers.

The basis by which participants will be selected or screened

Child participants must attend a mainstream childcare centre. A diagnosis of autism must be confirmed through a paediatrician's report. Children must be starting school in the subsequent year. Children will have functional use of verbal language at sentence level, meaning that they are able to verbally express their basic needs and wants with a range of communication partners in complete sentences. Additionally, children must demonstrate functional use of objects in play to be included in the study. Participants with co-morbid conditions associated with social and behaviour deficits will be excluded to ensure that data is based on the impact of autism on the individual rather than other social-communication difficulties.

If more potential participants apply to participate in this research project, participants who attend child care centres in close proximity of each other will be selected over other applicants.

The expected benefits of the research

This research can contribute to how goals are set to promote positive play interactions

between children with and without autism. As a small-scale pilot study, this project can

assist the development of larger studies in the future.

Risks to you or your child

Negligible risk is anticipated from participating in this research project. Children will be observed engaging in free-play in their natural environment and will have minimal contact with the researchers.

Your child's confidentiality

Identifiable data will not be shared beyond the research team and participating teachers. Results from initial screening assessments and observations made during play will be disclosed to each child's parent/caregiver and teacher. Any wider reporting of findings will involve de-identified data, with no mention of names or specific centres. Parents/caregivers of other children at the childcare centre will be informed that a research project will be taking place at the centre and that observation of their child may occur. The name and diagnosis of the child being specifically observed will not be disclosed to anyone beyond the research team and early childhood centre staff.

Information gathered during this research study will be securely stored electronically in accordance to Griffith University policies. All data will be de-identified after feedback has been given to each child's parent/caregiver and teacher. As required by Griffith University, all research data (provided reports, questionnaire responses, observation

notes, and analysis) will be retained in a locked cabinet and/or a password protected electronic file at Griffith University for a period of five years before being destroyed

Your participation is voluntary

Participation in this research project is voluntary. Participants are free to withdraw from the study at any time.

Questions / further information

Potential participants can contact Professor Jacqueline Roberts (j.roberts@griffith.edu.au) or Kim Kliman (kim.kliman@griffithuni.edu.au) via e-mail for additional information about this project. Additional information may then be provided via email or telephone.

The ethical conduct of this research

Griffith University conducts research in accordance with the *National Statement on Ethical Conduct in Human Research*. If potential participants have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on 3735 4375 or **research-ethics@griffith.edu.au**.

Feedback to you

Feedback of findings related to each child participant will be provided to parents/caregivers and teachers of each child. De-identified findings will be presented academically, such as in thesis and journal article form.

Privacy Statement

The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded. For further information consult the University's Privacy Plan at **http://www.griffith.edu.au/about-griffith/plans-publications/griffith-university-privacy-plan** or telephone (07) 3735 4375.

Appendix F

Consent Form for Caregivers of Child Participants

Behaviours of Children with autism that Facilitate Social Play with Typically Developing Peers in an Early Childhood Setting CHILD PARTICIPANT CONSENT FORM

Griffith University ethics reference number 2016/263

Research Team   Senior investigator: Professor Jacqueline Roberts
Contact Phone: (07) 3735 5630
Contact Email: j.roberts@griffith.edu.au
Senior investigator: Doctor Kate Simpson
Contact Email: k.simpson@griffith.edu.au
Research team: Kim Kliman
Contact Email: kim.kliman@griffithuni.edu.au
School of Education and Professional Studies

By signing below, I confirm that I have read and understood the information package

and in particular have noted that:

- I understand that my involvement in this research will include providing written confirmation of my child's diagnosis of Autism Spectrum Disorder, the completion of screening assessments, observation of my child during play at their early childhood centre, and two interviews about my child's social play between the researcher and my child's teacher;

- I have had any questions answered to my satisfaction;

- I understand the risks involved;

- I understand that there will be no direct benefit to me from my participation in this research;

- I understand that my participation in this research is voluntary

- I understand that if I have any additional questions I can contact the research team;

- I understand that I am free to withdraw at any time, without explanation or penalty;

- I understand that I can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on 3735 4375 (or research-ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project; and

- I agree to participate in the project.

Name of child	
Name of caregiver/parent	
Name of early childhood centre	
Signature	
Date	

Appendix G

Key Themes from Thematic Analysis of Interview Transcripts

Theme	Definition of Theme	Sub-theme	Definition of Sub-theme	Example
Special interests and skills	A special interest refers to a child's preferred activity or topic. A special skill refers to a skill in which the child shows competency.	Opportunities for interaction	Special interests or skills as focal point for social interactions.	"It is amazing and I can tell you that kids stay engaged for half an hour, with everyone singing and Sam was telling them. It's really amazing. I think he is one of the best players in the room, so he really has ideas. That's why he attracts kids, he has ideas." - Sam

"He washes the car and he, eventually, who has similar interests will join in, and this is how it goes and then they play." - Kevin |
| | | Obsessions | Special interests or skills as detrimental to social interactions. | "he has that obsession with cars so sometimes we have to remove cars to let him play with something else." – Kevin

"He's quite good. If he didn't have that obsession he would do much better." - Kevin |
| | | Limited social resources | Using special interests and skills as the primary means of engagement can restrict other engagement. | "kids eventually get bored when they play and kids move to another activity, so he doesn't follow them. If he followed them that would help him continue that interaction, I assume." – Kevin

"it's usually around his interests, but he eventually can join in and he's getting a lot better. Like he might cook and he might play in the sandpit or outside he would run around, but it's mostly, he's more likely to talk to you or interact if you talk about things that interest him." Kevin |
| | | Facilitating friendships | Special interests and skills facilitate the formation of | "have similar interests. They both like bugs and they love blocks." – Sam |

Theme	Definition of Theme	Sub-theme	Definition of Sub-theme	Example
			friendships and choice of play partners.	"He interacts with the same group, with the car group. Like, even if we do not have cars." – Kevin
Physical activity	The use of physical movement during play	Physical activity in social play	The use of physical activity to enhance a child's social play interactions.	"Outside she sometimes runs with kids and copies their actions and then she appears to be happy just being with them." – Rebecca "And then he started to do some silly things to get attention from peers so he would jump or lie down on the floor or throw himself on the floor to get attention." – Vincent
		Accessibility of physical activity	The impact of the environment to promote and allow for physical activity to be part of social play.	"Otherwise, outside he would eventually join. Like when kids jump it's easier because he doesn't need to talk or like he would follow kids in the sandpit and do the same actions so he would make cakes or whatever." - Vincent "But the thing is, if they move she wouldn't do anything. She wouldn't move unless they are outside and they are running, then she follows them. At the equipment. But not in play in the room, I haven't seen that." - Rebecca
Role of peers	The role of peers in social play interactions	Preference to lead or follow	A child's preference to either direct a play interaction or follow another child's instruction.	"Her being a follower, so that is it. Because she will play whatever they want. There are kids who are leaders and kids who are followers, so this is what attracts kids and this is what mum told me as well." – Rebecca
		Peer-teaching	Participants observe and imitate peers to acquire new play skills and engage in social play.	"so, if they're in the sandpit he will go to them and he will copy what they do. And inside if he plays with blocks they will join and play something with him." - Vincent
		Initiating interactions	The role of peers to initiate and maintain a social interaction during play.	"she would wait for the other kids and if she sees something interesting like kids playing in the home corner, she would go and observe. But then she wouldn't do anything, she basically waits for somebody to invite her to

Theme	Definition of Theme	Sub-theme	Definition of Sub-theme	Example
				play and then she plays nicely. But, if nobody invites her, she wouldn't play." – Rebecca
Conflict management	The impact of conflict on social play interactions	Sharing	Conflict around sharing space and materials with peers during play.	"And he realised if I want to play I need to share the space and materials. So, he started to share. In the block area it is easier because there are many blocks so he can share the space." – Sam "He would share and he would put it on and then he would go with kids. Or blocks, he would share that material." – Kevin
		Problem solving	Difficulty generating and implementing effective strategies to respond to social difficulties during play.	"Sometimes she doesn't understand situations properly, if she was told to move away, she would move away even if she was happy, because she thinks she needs to move away. So, it's really hard." – Rebecca "He has to learn that if you want to play with somebody you sometimes need to follow somebody else's ideas." - Sam
Verbal behaviours	The use of verbal communication during play	Verbal success	Verbal communication skills as a determiner for successful play interactions with peers.	"If she is about to join in she wouldn't say, 'oh, what are you doing?'. She wouldn't make comments, or 'are you doing something?'. She just waits." - Rebecca "He still interacts, but it's not like play, it's not like he has those conversational skills." - Kevin
		Verbal value	Verbal communication skills as highly valued for evaluating a child's ability to engage in social play.	"I think language. He needs that really badly. And I think he's frustrated because he can't talk and partially his behaviour" – Vincent
Enjoyment	The emotional reward experienced during play	Enjoyment in play	The interaction between enjoyment of social play and children's own interests.	"And he realised if I want to play I need to share the space and materials. So, he started to share. In the block area it is easier because there are many blocks so he can share the space." – Sam

Theme	Definition of Theme	Sub-theme	Definition of Sub-theme	Example
				"so he plays with them, and he loves playing with kids, but if he's building his garage or whatever and the kid puts a block on top of his structure he will remove that block a little bit because he has it in his mind, but he still plays, he wouldn't move away. Or, he lets other kids join in and lets them play with the same toys, so that's it." - Vincent

Appendix H

Observation Sheet

Play activity	Antecedent Play behaviours of child with autism	Behaviour Response from a peer	Consequence Continuation of play	Participation	Duration of activity until termination	Additional notes on context (e.g. setting, number of children involved)
					Start time: End time: Total duration:	
					Start time: End time: Total duration:	
					Start time: End time: Total duration:	
					Start time: End time: Total duration:	

Play activity. A recreational activity that focuses on a common object, movement, or theme. The activity may be functional or symbolic. A functional activity involves using objects in the way in which they are intended, such as stacking blocks. A symbolic activity involves the use of objects or performance of actions in a way that that does not represent current reality (Orr & Geva, 2015), such as pretending that Play Doh is food during an imaginary tea party.

Antecedent: Play behaviour of child with autism. A verbal or nonverbal action that forms one part of a play routine. Examples of play behaviours include functional use of play objects, object substitution, imagining absent objects, assigning absent attributes to objects, and verbalisations (Barton, 2010). Examples of verbalisations to be coded include requests, responses, descriptions, statements, organisational devices and performatives (Cole, Dore, Hall, & Dowley, 1978). A play routine is defined as a functional or symbolic act that is performed as a recreational activity. Behaviours performed concurrently will be coded together. For example, a child holding a toy dinosaur out towards a peer and saying 'roar' will be coded as one act consisting of multiple behaviours. Behaviours will be recorded as a written description.

Behaviour: Response from a peer. A response from a peer is defined as a verbal or nonverbal acknowledgement of the child with autism's play behaviour. In the case of parallel play, a response may be defined as a verbal or non-verbal continuation of parallel play. If more than one peer is involved in the observed play activity, all play behaviours related to the participation of the child with autism will be coded.

Consequence: Continuation of play. The consequence of peers' response to the child with autism's play behaviour will be recorded in relation to the continuation of play with each other. Whether the play interaction continues around the same activity (1), continues around a different activity (2), or is terminated (3) will be numerically coded.

1. **Continues:** The target child and peer continue to engage in play around the same object or theme as each other in parallel, associative, or cooperative play.

2. **Refocused:** The target child and peer engage in parallel, associative, or cooperative play with each other around a different activity than immediately prior to the target child's play action.

3. **Terminates:** The play interaction between the target child and peer ends. Termination is defined when an interaction ceases and the children are no longer engaged in the same activity.

Duration of activity. Duration of activity will be measured in minutes by recording the start and end time of each play activity and subtracting the difference. The start time will be recorded when a response from a peer to a play behaviour from the child with autism is observed, as defined in 'Behaviour.' An end time will be recorded when a play activity is refocused or terminated.

Participation. The categories of social participation during play will be numerically coded. Parallel (1), associative (2), and cooperative play (3) will be recorded. As this research project focuses on responses from peers during play, onlooker and solitary independent play will not be recorded.

1. **Parallel play:** Parallel play is defined as the child with autism playing alongside a peer while engaging in a similar object focus or imaginative theme without interacting with each other.

2. **Associative play:** Associative play is defined as the child with autism interacting with a peer during play, without coordination their activity with each other. \

3. **Cooperative play:** Cooperative play is defined as play involving peers taking on a different role to each other to achieve a common goal.

Appendix I

Information Sheet for Inter-rater Reliability Training

INFORMATION SHEET FOR UPCOMING RESEARCH PROJECT THAT WILL TAKE PLACE IN YOUR CHILD'S EARLY CHILDHOOD CENTRE

Who is conducting the research

Senior investigator: Professor Jacqueline Roberts
Contact Phone: (07) 3735 5630
Contact Email: j.roberts@griffith.edu.au
Senior investigator: Doctor Kate Simpson
Contact Email: k.simpson@griffith.edu.au
Research team: Kim Kliman
Contact Email: kim.kliman@griffithuni.edu.au
School of Education and Professional Studies

Why is the research being conducted?

The research project is being conducted to gather information on behaviours used by children with a specific disorder that lead to successful play with typically developing peers. This research will be conducted by a student researcher under the supervision of staff at Griffith University.

What you will be asked to do

A researcher will be collecting observational data of children interacting with their peers in order to practice and refine data collection methods that will be used at a later date. As any observations recorded are for training purposes only, no identifiable information will be collected and no data will be kept beyond the training period. Your child will not have any contact with the researcher apart from incidental contact that may occur from being in close proximity.

The expected benefits of the research

This research can contribute to how goals are set to promote positive play interactions

between children with and without a specific disorder. As a small-scale pilot study, this

project can assist the development of larger studies in the future.

Risks to you or your child

Negligible risk is anticipated from participating in this research project. Children will be observed engaging in free-play in their natural environment and will have minimal contact with the researchers. Your child will not be the primary focus of this research project.

Your confidentiality

Identifiable data will not be collected about your child. Descriptive data of play will be securely stored electronically in accordance to Griffith University policies.

Your participation is voluntary

Consent for participation will be determined through an "opt-out system." Meaning, parents/guardians may contact the researcher to request that no observations of their child's play are recorded. Participation in this research project is voluntary. Participants are free to withdraw from the study at any time.

Questions / further information

Professor Jacqueline Roberts (j.roberts@griffith.edu.au) or Kim Kliman (kim.kliman@griffithuni.edu.au) can be contacted via e-mail for additional information about this project. Additional information may then be provided via email or telephone. In the interest of confidentiality for children who are the primary focus of this research project, information about the nature of the disorder being studied cannot be disclosed.

The ethical conduct of this research

Griffith University conducts research in accordance with the *National Statement on Ethical Conduct in Human Research*. If you have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on 3735 4375 or **research-ethics@griffith.edu.au**.

Feedback to you

As your child is not the focus of this research project, feedback of results will not be provided. Feedback will only be provided to parents/caregiver and teachers directly involved in the research project. De-identified findings will be presented academically, such as in thesis and journal article form.

Privacy Statement

The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for

other research purposes.   However, your anonymity will at all times be safeguarded. For further information consult the University's Privacy Plan at **http://www.griffith.edu.au/about-griffith/plans-publications/griffith-university-privacy-plan** or telephone (07) 3735 4375.

Appendix J

Griffith University Human Research Ethics Review

5/19/16

GRIFFITH UNIVERSITY HUMAN RESEARCH ETHICS REVIEW

Dear Prof Jacqueline Roberts

I write further to the additional information provided in relation to the provisional approval granted to your application for ethical clearance for your project "Play in children with Autism Spectrum Disorder" (GU Ref No: 2016/263).

This is to confirm that this response has addressed the comments and concerns of the HREC.

The ethics reviewers resolved to grant your application a clearance status of "Fully Approved".

Consequently, you are authorised to immediately commence this research on this basis.

Regards

Kim Madison
Policy Officer, Human Research Ethics and Integrity
Office for Research
Bray Centre, Nathan Campus
Griffith University
ph: +61 (0)7 373 58043
fax: +61 (07) 373 57994
email: k.madison@griffith.edu.au

Appendix K

Information Sheet for Caregivers of Peers

INFORMATION SHEET FOR UPCOMING RESEARCH PROJECT THAT WILL TAKE PLACE IN YOUR CHILD'S EARLY CHILDHOOD CENTRE

Griffith University ethics reference number 2016/263

Who is conducting the research

Senior investigator: Professor Jacqueline Roberts
Contact Phone: (07) 3735 5630
Contact Email: j.roberts@griffith.edu.au
Senior investigator: Doctor Amanda Webster
Research team: Kim Kliman
Contact Email: kim.kliman@griffithuni.edu.au
School of Education and Professional Studies

Why is the research being conducted?

The research project is being conducted to gather information on behaviours used by children with a specific disorder that lead to successful play with typically developing peers. This research will be conducted by a student researcher under the supervision of staff at Griffith University.

What you will be asked to do

A researcher will be collecting observational data on a child that attends the same early childhood centre that your child attends. As part of data collection, descriptions of how your child responds to play behaviours may be recorded in written form. Your child will not have any contact with the researcher apart from incidental contact that may occur from being in close proximity.

The expected benefits of the research

This research can contribute to how goals are set to promote positive play interactions between children with and without a specific disorder. As a small-scale pilot study, this project can assist the development of larger studies in the future.

Risks to you or your child

Negligible risk is anticipated from participating in this research project. Children will be observed engaging in free-play in their natural environment and will have minimal contact with the researchers. Your child will not be the primary focus of this research

project.

Your confidentiality

Identifiable data will not be collected about your child. Descriptive data of play will be securely stored electronically in accordance to Griffith University policies.

Your participation is voluntary

Consent for participation of peers will be determined through an "opt-out system." Meaning, parents/guardians may contact the researcher to request that no observations of their child's play are recorded. Participation in this research project is voluntary. Participants are free to withdraw from the study at any time.

Questions / further information

Kim Kliman can be contacted via e-mail (kim.kliman@griffithuni.edu.au) for additional information about this project. Additional information may then be provided via email or telephone. In the interest of confidentiality for children who are the primary focus of this research project, information about the nature of the disorder being studied cannot be disclosed.

The ethical conduct of this research

Griffith University conducts research in accordance with the *National Statement on Ethical Conduct in Human Research*. If you have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on 3735 4375 or **research-ethics@griffith.edu.au**.

Feedback to you

As your child is not the focus of this research project, feedback of results will not be provided. Feedback will only be provided to parents/caregiver and teachers directly involved in the research project. De-identified findings will be presented academically, such as in thesis and journal article form.

Privacy Statement

The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements.   A de-identified copy of this data may be used for other research purposes.   However, your anonymity will at all times be safeguarded. For further information consult the University's Privacy Plan at http://www.griffith.edu.au/about-griffith/plans-publications/griffith-university-privacy-plan or telephone (07) 3735 4375.